

DENON

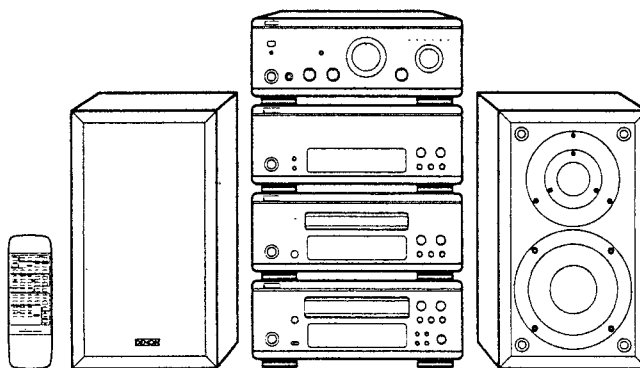
Hi-Fi Personal Component System

Europe, U.K. &
Asia Models

SERVICE MANUAL

MODEL D-F88

PERSONAL COMPONENT SYSTEM



Unit No. UPA-F88	(Pre-Main Amplifier)
Unit No. UTU-F88	(AM, FM Stereo Tuner)
Unit No. UCD-F88	(Compact Disc Player)
Unit No. UDR-F88	(Cassette Tape Deck)

- The D-F88 Personal Component System consists of the following:

AM, FM Stereo Tuner Unit	UTU-F88
Pre-Main Amplifier Unit	UPA-F88
Compact Disc Player Unit	UCD-F88
Cassette Tape Deck Unit	UDR-F88
Remote Control Unit	RC-830: Europe model, RC-829: Asia model
Speaker Unit	SC-F88 (Option for Asia model)

- Some illustrations using in this service manual are slightly different from the actual set.
- The tuner section of Asia model is not corresponded with RDS (Radio Data System).

NIPPON COLUMBIA CO., LTD.

GENERAL SECTION

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SPECIFICATIONS

■ Pre-main amplifier (UPA-F88)

Rated output power:

Low frequency adjustment range:

High frequency adjustment range:

Audio input / output jacks:

Power supply:

Power consumption:

Maximum external dimensions:

Weight:

45 W + 45 W (4 Ω / ohms, DIN)

100 Hz $\pm$ 8 dB

10 kHz $\pm$ 8 dB

CD input jacks, TAPE input/output jacks,

TUNER input jacks, MD input/output jacks, DVD/AUX input jacks,

6.3 mm headphones jack and PHONO input jacks

AC230 V, 50 Hz Europe model, AC115/230 V, 50/60 Hz Asia model

120 W

270 (W) $\times$ 112 (H) $\times$ 330 (D) mm

(10-5/8" $\times$ 4-13/32" $\times$ 12-63/64")

(including feet, controls and terminals)

5.3 kg (11 lbs. 11 oz)

■ Tuner (UTU-F88)

Reception frequency band:

Reception sensitivity:

FM stereo separation:

Power supply:

Power consumption:

Maximum external dimensions:

Weight:

FM: 87.50 MHz – 108.00 MHz

AM: 522 kHz – 1611 kHz

FM: 1.5 μ V / 75 Ω / ohms

AM: 20 μ V

35 dB (1 kHz)

AC230 V, 50 Hz Europe model, AC115/230 V, 50/60 Hz Asia model

10 W

270 (W) $\times$ 112 (H) $\times$ 297 (D) mm

(10-5/8" $\times$ 4-13/32" $\times$ 11-45/64")

(including feet, controls and terminals)

2.6 kg (5 lbs. 12 oz)

■ CD player (UCD-F88)

Wow & flutter:

Sampling frequency:

Optical source:

Power supply:

Power consumption:

Maximum external dimensions:

Weight:

Below measurable limits

($\pm$ 0.001% W. peak)

44.1 kHz

Semiconductor

AC230 V, 50 Hz Europe model, AC115/230 V, 50/60 Hz Asia model

10 W

270 (W) $\times$ 112 (H) $\times$ 297 (D) mm

(10-5/8" $\times$ 4-13/32" $\times$ 11-45/64")

(including feet, controls and terminals)

3.1 kg (6 lbs. 13 oz)

■ Cassette deck (UDR-F88)

Type:

Heads:

Tape speed:

Included circuits:

Usable tapes:

Power supply:

Power consumption:

Maximum external dimensions:

Weight:

Horizontal 4-track 2-channel stereo auto reverse cassette deck

1 hard permalloy recording/playback head

1 double-gap ferrite erasing head

4.75 cm/s

Dolby B and C NR, Dolby HX Pro

Normal, chrome and metal

AC230 V, 50 Hz Europe model, AC115/230 V, 50/60 Hz Asia model

14 W

270 (W) $\times$ 112 (H) $\times$ 305 (D) mm

(10-5/8" $\times$ 4-13/32" $\times$ 12-1/64")

(including feet, controls and terminals)

3.7 kg (8 lbs. 3 oz)

■ Remote control unit (RC-830): Europe model, (RC-829): Asia model

Remote control system:

Number of buttons:

Power supply:

Maximum external dimensions:

Weight:

Infrared pulse

51: Europe model, 47: Asia model

Two DC 1.5V R6P/AA batteries

64 (W) $\times$ 195 (H) $\times$ 18 (D) mm

(2-1/2" $\times$ 7-43/64" $\times$ 23/32")

130 g (including batteries) (Approx. 4.6 oz)

- * Maximum dimensions include controls, jacks, and covers.

(W) = width, (H) = height, (D) = depth

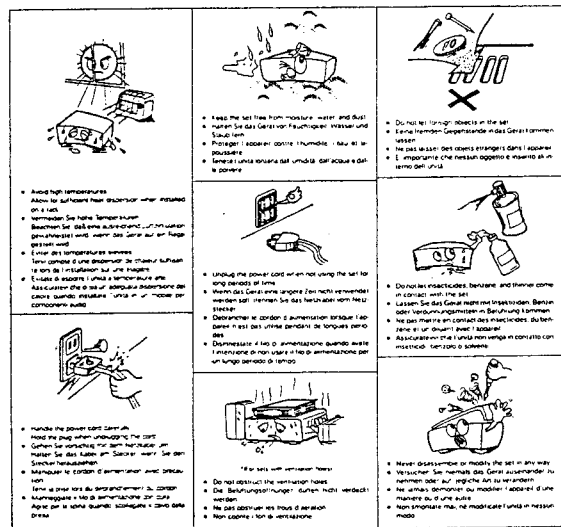
- For improvement purposes, specifications and functions are subject to change without advanced notice.

■ Dolby noise reduction and HX Pro headroom extension manufactured under license from Dolby Laboratories Licensing Corporation.

HX Pro originated by Bang & Olufsen.

■ "DOLBY", the double-D symbol  and "HX PRO" are trademarks of Dolby Laboratories Licensing Corporation.

GENERAL SECTION

NOTE ON USE / HINWEISE ZUM GEBRAUCH
OBSERVATIONS RELATIVES À L'UTILISATION / NOTE SULL'USO

CAUTION / VORSICHT / ATTENTION / AVVISIO

- If the system should smoke or produce strange smells, immediately set the power switch to the STANDBY position, unplug the power cord, and contact your dealer or distributor.
- Sollte das Gerät rauchen oder eigenartige Gerüche streichen, stellen Sie den Netzschalter sofort auf die Position STANDBY, ziehen Sie den Netzkabel heraus und kontaktieren Sie Ihren Händler.
- Si le système doit émettre de la fumée ou produire des odeurs étranges, placez l'interrupteur d'alimentation immédiatement sur la position de veille (STANDBY), débranchez le câble d'alimentation et contactez le distributeur.
- Se il sistema dovesse produrre fumo o odori strani, collocare immediatamente l'interruptore di alimentazione nella posizione STANDBY, disinnestare il filo di alimentazione e rivolgervi al negoziante di fiducia.

SAFETY IMPORTANT

WARNING:
TO PREVENT FIRE OR SHOCK HAZARD, DO NOT EXPOSE THIS APP. TO RAIN OR MOISTURE

ATTENZIONE: QUESTO APPARECCHIO È DOTATO DI DISPOSITIVO OTTICO CON RAGGIO LASER. L'USO IMPROPRIO DELL'APPARECCHIO PUÒ CAUSARE PERICOLOSE ESPOSIZIONI A RADIAZIONI!!

*SERIAL NO.
PLEASE RECORD UNIT SERIAL NUMBER ATTACHED TO THE REAR OF THE CABINET FOR FUTURE REFERENCE*

• INSTALLATION PRECAUTIONS

For heat dissipation, leave at least 10 cm of space between the top, back and sides of this unit and the wall or other components.

• PRECAUTIONS D'INSTALLATION

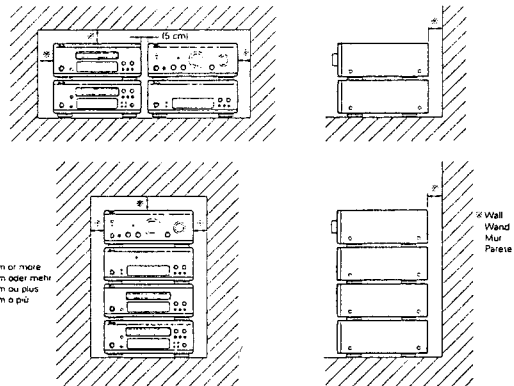
Afin de dissiper la chaleur, laissez un espace d'au moins 10 cm entre le haut, l'arrière et les côtés de cet appareil et le mur ou un autre composant.

• VORKEHRUNGEN ZUR INSTALLATION

Lassen Sie zur Wärmeabfuhr mindestens 10 cm Raum zwischen der Oberseite, der Rückseite und den Seiten des Gerätes und der Wand oder anderen Komponenten.

• PRECAUZIONI RIGUARDANTI L'INSTALLAZIONE

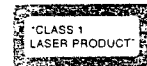
Per consentire una buona dissipazione del calore, lasciate uno spazio di almeno 10 cm tra la parte superiore, posteriore e laterali di quest'unità e le pareti o gli altri componenti.

CLASS 1 LASER PRODUCT
LUOKAN 1 LASERILÄITE
KLASS 1 LASERAPPARAT

ADVARSEL: UDBYTTIG LASERSTRÅLING VED ÅBNING. NÅR SÆKKESKEDSÅBENINGEN ER LUKET, ER FUNKTION UDSÆTTET FOR STRÅLING.

VAROITUS: LAITTEEN KÄYTTÄMINEN MUOKALLA KUIN TÄSÄÄ KÄYTTÖOHJEKSESSA MAINITTUILLA TAVOILLA SAATAAN ALITSIKÄÄ KÄYTTÄJÄN TURVALLISUUSLUOKAN 1 LUOKALLE NÄKYVÄTTÖMÄLLÄ LASERILÄITELLE.

WARNING: OM APPARATEN ÅPNINGS PÅ ANMÅT SÄTT AN I DENNA BRUKSANVISNING SPECIFIKERATS, KAN ANVÄNDAREN UTSÄTTAS FÖR OÖNSKAD LASERSTRÅLNING SOM ÖVERSKRIDER GRÄNSEN FÖR LASERKLASS 1.

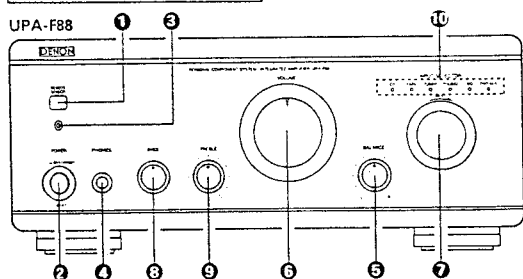


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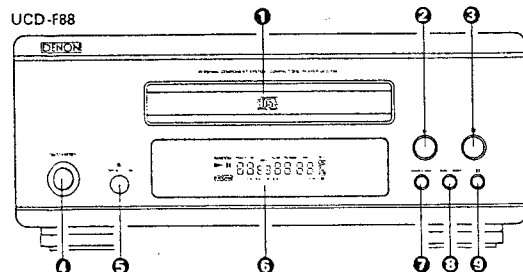
FRONT PANEL / FRONTPLATTE / PANNEAU AVANT / PANNELLO ANTERIORE

PRE-MAIN AMPLIFIER
VORVERSTÄRKER
AMPLIFICATEUR-PRÉAMPLIFICATEUR
PREAMPLIFICATORE PRINCIPALE

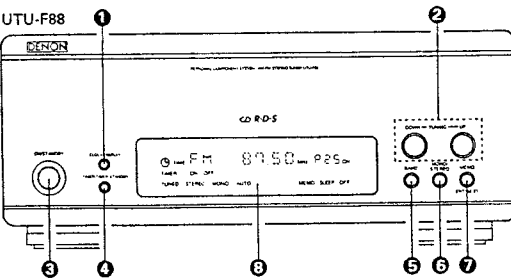
See ENGLISH Page 6
Sehen Sie DEUTSCH Seite 30
Voir FRANÇAIS Page 54
Fate riferimento alla sezione ITALIANO alla pagina 78

CD PLAYER
CD-SPIELER
LECTEUR CD
DISPLAY DELLA PIASTRA A CASSETTE

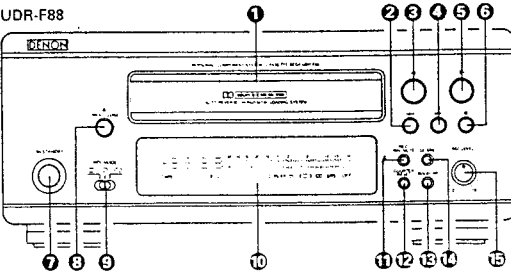
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STEREO TUNER
STEREO EMPFÄNGER
TUNER STEREO
SINTONIZZATORE STEREO

See ENGLISH Page 6
Sehen Sie DEUTSCH Seite 30
Voir FRANÇAIS Page 54
Fate riferimento alla sezione ITALIANO alla pagina 78

CASSETTE DECK
CASSETTENECK
PLATINE CASSETTE
PIASTRA A CASSETTE

See ENGLISH Page 8
Sehen Sie DEUTSCH Seite 32
Voir FRANÇAIS Page 56
Fate riferimento alla sezione ITALIANO alla pagina 80



- Per andare better in the starting the operation method, the unit is used in this manual, it is different from the actual system.
- Als Anfangsstellung des Betriebes, die Methode in diesem Handbuch ist die der Abbildungen in dieser Bedienungsanleitung, die vom tatsächlichen System unterscheidet.
- Pour aller à la commande de la méthode de fonctionnement, les illustrations utilisées dans ce manuel peuvent être différentes de celles de l'installation réelle.
- Per andare a scegliere il metodo operativo più facile, le illustrazioni usate in questo libretto che illustrano possono differire dal sistema stesso.

GENERAL SECTION

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Check that the following parts are included in the package aside from the main unit:

- UPA-F88 (Pre-main amplifier unit)
- Remote control unit (RC-830)
- RSP/AA batteries
- Operating instructions
- UTTU-F88 (AM/FM stereo tuner)
- FM antenna
- AM loop antenna
- System connector cable
- RCA pin-plug cord
- UCD-F88 (compact disc player)
- System connector cable
- RCA pin-plug cord
- UDR-F88 (cassette tape deck)
- System connector cable
- RCA pin-plug cord

1 MAIN FEATURES

- RDS compatible
Compatible with various RDS services, including program service name (PS), program type identification (PTY), traffic program identification (TP) and clock time (CT).
- Quality power for high quality sound
45W + 45W (4 Ω/ohms DIN) high quality amplifier and terminals for large speakers.
- High sound quality, multi-function CD player
EAT function for automatically dividing the tracks on a CD for recording onto sides A and B of a tape.

- Cassette deck with Dolby B, C and MX-Pro circuits
For playback and recording of high quality sound.
- Two types of timers
Two timer settings can be made — everyday and sleep.
- Easy-to-use remote control unit
- Auto on function
The power turns on automatically and playback begins when the play button on the CD player or the cassette deck or the tuner preset up/down buttons on the remote control unit are pressed.

2 BEFORE USING

Read the following before using the system.

- Before turning on the power
Check again that all connections are correct and that there are no problems with the connection cords. Be sure to unplug the power cord before connecting or disconnecting the connection cords.
- Humming may be produced if this system is set near a TV or other audio equipment. If this happens, try changing the position of the equipment or the connection cords.
- Moving the system
Be sure to remove CDs before moving the system. If a CD is left in the CD player, it may be scratched. To prevent short-circuits or damage to the connection cords, always unplug the power cord and disconnect all connection cords to other audio equipment.

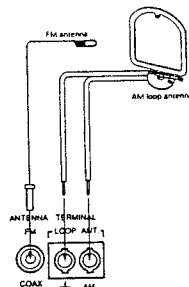
- Condensation (dew)
Condensation (water droplets) may be produced on internal optical lenses or discs in the following cases:
 - Directly after a heater is turned on.
 - When the system is in a steamy or humid room.
 - When the system is moved abruptly from a cold place to a warm room.
- Should condensation occur:
The signals on the disc cannot be read and the system will not function properly. Remove the disc then let the system set with the power on. The condensation will evaporate in one hour or less, at which time the system will function normally.

Note that some of the illustrations used for explanations in this manual may differ from the actual system.

3 CONNECTING THE INCLUDED ANTENNAS

Installing the FM indoor antenna

Tune in an FM station (see Page 10). Set the antenna in a position in which distortion and noise is minimum, then fasten the tip of the antenna in this position using tape or a pin.



Installing the AM loop antenna

Tune in an AM station (see Page 10) and set the antenna in a position as far from the system as possible in which distortion and noise is minimum. In some cases it is best to invert the polarities. AM broadcasts cannot be received well if the loop antenna is not connected or if it is set close to metal objects.

Assembling the AM loop antenna

Assemble the included AM loop antenna as shown in the diagram.

- 1 Remove the clamp.
- 2 Insert the AM loop antenna into the antenna stand.



Connecting the AM loop antenna

Connect the included AM loop antenna to the antenna terminals as shown in the diagram.

- 1 Loosen the terminal knobs.
- 2 Insert the antenna wire.
- 3 Tighten the terminal knobs.



Connecting an FM outdoor antenna

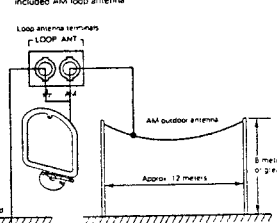
If good reception cannot be achieved with the included FM antenna, use an FM outdoor antenna. Connect an F-shaped connector to the coaxial cable and connect the antenna to the FM COAX (75 Ω) terminal.

Selecting a place for the FM outdoor antenna

- Set the antenna so that it is pointing towards the broadcast station's transmitting antenna. Behind buildings or mountains, set the antenna in the position at which reception is best, and also try changing the direction of the antenna.
- Do not install the antenna under power lines.
- Doing so is extremely dangerous, as the power line could touch the antenna.
- Install the antenna away from roads or train tracks to avoid noise from cars or trains.
- Do not install the antenna too high, as it may be hit by lightning.

Installing an AM outdoor antenna

Connect the signal wire from the AM outdoor antenna to the antenna terminal. Be sure to ground the antenna and connect the ground wire to the GND terminal. Also be sure to connect the included AM loop antenna.



4 CONNECTIONS

NOTE:

This system includes digital circuitry which may cause interference such as color banding or changes in the color on TV. If this happens, move the system and the TV as far apart as possible.

Use a record player with an MM cartridge.

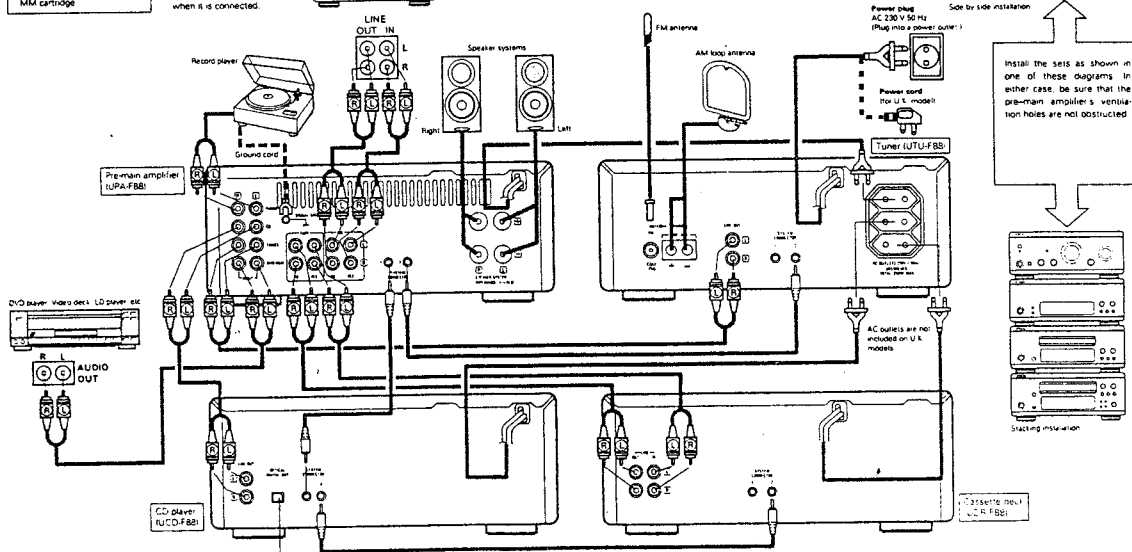
- Disconnect the ground cord if humming or noise is produced when it is connected.

Connecting the speaker systems

Connect the speaker system for the left channel (the left side as seen from the front) to the "L" terminals, the speaker system for the right channel to the "R" terminals. Be sure to use speaker systems with an impedance of 8 Ω/ohms or greater.



CAUTION:
Whenever the power switch is in the STANDBY position, the unit is still connected on AC line voltage. Please be sure to unplug the cord when you leave home for a vacation.



System operations

Such system operations as the timer and the auto on functions, as well as remote control operations cannot be performed unless all the RCA pin-plug cords and system connector cords are connected between the units. So be sure to make all the connections properly as shown in the diagram. Also, disconnecting system connector cords while the system is operating may result in malfunction. Be sure to turn unplug the power cord before changing connections.

OPTICAL DIGITAL OUT jack
Digital data is output in optical form from this jack.

NOTES

- Do not plug the power cord into the power outlet until all connections are completed. Be sure to properly connect the channels (L to L, R to R) and the R (red) plug properly as shown in the diagram.
- Insert the plugs securely. Incomplete connections may result in noise.
- Be sure to connect the speaker cords between the speaker terminals and the speaker systems with the same polarities (+ to +, - to -). If the polarities are switched, the sound at the center will be weak, the effect on the different instruments will be unclear, and the stereo effect will be lost.
- After unplugging the power cord, wait about 5 seconds before plugging it back in.
- Note that setting the connection cords (pin-plug cords) next to the power cords may result in humming or other noise.

GENERAL SECTION

5 PART NAMES, FUNCTIONS AND DISPLAYS

PRE-MAIN AMPLIFIER

1 REMOTE SENSOR

When operating the remote control unit, point it at this sensor.

2 POWER switch

Use this button to turn the power of the entire system on and off (standby). When pressed and set to the "ON" position, the power turns on. Press again to set to the "OFF" position. (The other units are set to the power standby mode.)

NOTE:

When the POWER button is set to the "OFF" position, it is not possible to use the remote control unit or the timer.
To use the remote control unit and timer, press the POWER button on the remote control unit (RC-630) when the D-F88's POWER button is already set to the "ON/STANDBY" position and set the D-F88 to the standby mode.

The tuner's power may not turn on if the POWER button is set to the "ON" position directly after the power cord is plugged into the power outlet.
Wait until the tuner's time display turns on before pressing the POWER button.

3 Power indicator

This turns on when the POWER button is set to the "ON/STANDBY" position.
The indicator flashes immediately after the POWER button is pressed and the power is turned on.

4 PHONES (headphones jack)

Plug the headphones into this jack.
No sound is produced from the speakers when headphones are plugged in.

5 BALANCE control

Use this to adjust the balance of the volume between the left and right channels. When set at the center position, the volume is the same for the left and right channels.

6 VOLUME control

Use this to adjust the overall volume.
The volume increases when the control is turned clockwise (↻) and decreases when it is turned counterclockwise (↺).

7 INPUT SELECTOR (function) knob

The function switches in the following order each time the control is turned clockwise (↻):
CD - TAPE - TUNER - PHONO - MD - DVD/AUX
(The control cannot be turned counterclockwise.)

8 BASS control

Use this to adjust the volume of the low frequencies.

9 TREBLE control

Use this to adjust the volume of the high frequencies.

10 Function indicators

These light to indicate the currently selected function.

TUNER

1 CLOCK/DISPLAY selector button

This button is used to switch the display between the reception frequency and the clock.

2 TUNING UP AND DOWN buttons

These buttons are used to select AM and FM stations and to set the clock and timer.

3 Power operation switch ION/STANDBY

Press this button once to turn the tuner's power on, then press again to set the tuner to the standby mode in the standby mode. "OFF" appears on the display.

4 TIMER/TIMER STANDBY button

Press this when setting the timer and to turn the timer on so that it operates at the set times.
When the button is pressed after the timer has been set, the timer standby mark (⏰) appears on the display.
Press again to turn the timer off.
The timer will not operate when the ⏰ mark is off.

5 BAND (AM/FM) selector button

The band switches between AM and FM each time this button is pressed.

6

6 MONO/STEREO selector button

AUTO mode:
Use this mode to receive programs in stereo.
The sound and the indicators on the display automatically switch between monaural ("MONO") and stereo ("STEREO") according to whether the program is being broadcast in monaural or stereo.

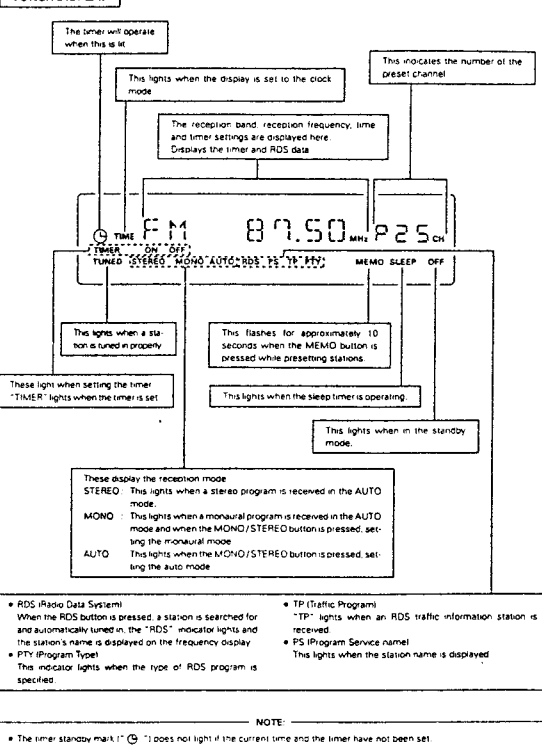
MONO mode:
Use this mode to receive programs in monaural regardless of whether they are being broadcast in monaural or stereo.
Set this mode if there is much noise or if the signals are weak when receiving stereo programs (when "AUTO" is set).

7 MEMO ENT/NEXT button

This button is used to preset AM and FM stations and when setting the timer.

8 Display

TUNER DISPLAY



CD PLAYER

1 Disc tray

Load disc here.

2 [play] button

Press this button to start playing the disc.
Even when the disc tray is open, the disc tray closes and playback begins when this button is pressed.
When pressed in the standby mode, the power automatically turns on and playback begins. (Auto on function)

3 [stop] button

Press this button to stop playback.

4 Power operation switch ION/STANDBY

Press this once to turn the CD player's power on, then press again to set the CD player to the standby mode. In the standby mode, "OFF" appears on the display.

5 OPEN/CLOSE button

Press this to open and close the disc tray.
When pressed once, the disc tray opens out, and when pressed again, the disc tray closes. If a disc is loaded, the total number of tracks and total playing time of the disc are displayed seven seconds after the disc tray is closed.
When pressed in the standby mode, the CD player's power turns on.

6 Display

7 [rewind] button

(automatic/manual search reverse) button
Use this to move to the beginning of a specific track.
When pressed during playback or in the pause mode, the pickup moves backward a number of tracks equal to the number of times the button is pressed.

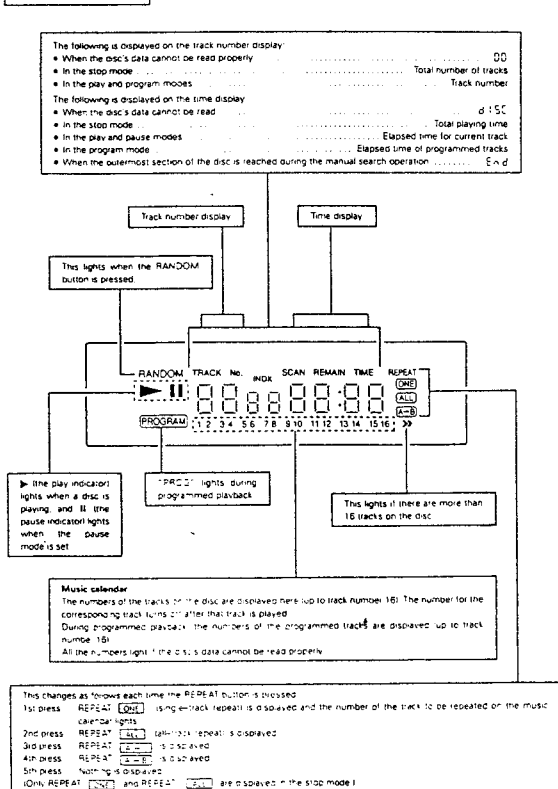
8 [fast forward] button

(automatic/manual search forward) button
Use this to move to the beginning of a specific track.
When pressed during playback or in the pause mode, the pickup moves forward a number of tracks equal to the number of times the button is pressed.
The automatic search mode is set if the [rewind] or [fast forward] button is released within 0.5 seconds, and the manual search mode is set if the button is held for over 0.5 seconds.

9 [pause] button

Press this button to stop playback temporarily.
Press the play button to cancel the pause mode and resume playback.

CD PLAYER DISPLAY



GENERAL SECTION

CASSETTE DECK

- 1. Cassette tray**
The cassette tray opens out when the OPEN/CLOSE button is pressed. Load the cassette tape with the side on which the tape is exposed facing away from you. To close the cassette tray, press the OPEN/CLOSE button again. For details, refer to Page 18.
- 2. (rewind) button**
Press this button to rewind the top side of the tape. The bottom side of the tape is fast-forwarded. Also use this button to search for the beginning of the current selection when playing in the forward (▶) direction, or to search for the beginning of the following selection when playing in the reverse (◀) direction.
- 3. (reverse play) button**
Press this button to play the bottom side of the tape. If this button is pressed in the standby mode, the power of the cassette deck and pre-main amplifier automatically turns on and playback begins (AUTO ON function).
- 4. (fast-forward) button**
Press this button to fast-forward the top side of the tape. The bottom side of the tape is rewound. Also use this button to search for the beginning of the following selection when playing in the forward (▶) direction, or to search for the beginning of the current selection when playing in the reverse (◀) direction.
- 5. (forward play) button**
Press this button to play the top side of the tape. If this button is pressed in the standby mode, the power of the cassette deck and pre-main amplifier automatically turns on and playback begins (AUTO ON function).
- 6. (stop) button**
Press this button while the tape is moving to stop the tape.
- 7. Power operation switch (ON/STANDBY)**
Press this once to turn the cassette deck's power on, then press again to set the cassette deck to the standby mode in the standby mode. "OFF" appears on the display.
- 8. OPEN / CLOSE button**
Press this to open and close the cassette tray. When pressed in the standby mode, the cassette deck's power turns on.

REV. MODE selector switch

Use this to select the direction of tape travel. For details, refer to Page 17.

Display

REC / REC MUTE button

This button is used when recording and when creating blank spaces between selections. If only the REC / REC MUTE button is pressed, the recording pause mode is set. Press the button again while in the recording pause mode to set the recording mute mode for approximately 5 seconds, after which the mode returns to the recording pause mode. If the ▶ or ◀ is pressed in the recording pause mode, recording starts on the side of the tape corresponding to that button. The recording pause mode is set when this button is pressed for less than 0.5 seconds while in the recording mode. If it is pressed for over 0.5 seconds while in the recording mode, the recording mute mode is set for approximately 5 seconds, after which the recording pause mode is once again set. Press the (stop) button to cancel the recording pause mode.

NOTE:
If the play button or the CD player is pressed during the recording pause mode, recording of the CD begins automatically.

COUNTER RESET button

Press this button to reset the tape counter to "0000".

DOLBY NR mode selector button
Use this to select the Dolby NR mode (OFF, B or C). When playing a tape, set the Dolby NR mode to the same mode as when the tape was recorded.

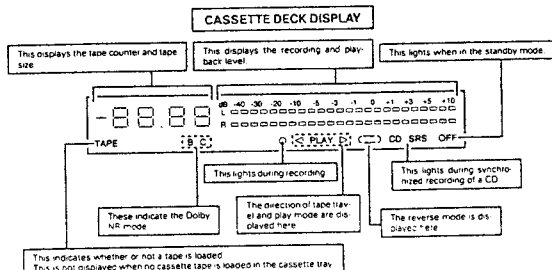
OFF B C

CD SRS (Synchronized Recording System) button

Use this button for synchronized recording of CDs. For details, refer to Page 19.

REC LEVEL control

Use this to set the recording level. For details, refer to Page 19.



6 REMOTE CONTROL UNIT

The D-F88 comes with a system remote control unit (RC-830).

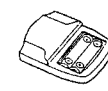
Inserting the batteries

- NOTES:**
- Use R6P (AA) batteries in this remote control unit.
 - Replace the batteries with new ones approximately once each year, though this depends on how frequently the remote control unit is used.
 - Remove the batteries with new ones earlier if the remote control unit does not operate even from a short distance.
 - Insert the batteries in the proper + and - direction, following the marks in the battery compartment.
 - Remove the batteries when not using the remote control unit for extended periods of time.
 - To avoid damage and leakage:
 - Do not use a new battery with an old one.
 - Do not use two different types of batteries.
 - Do not short-circuit, take apart, heat or dispose of batteries in flames.
 - If the batteries should leak, carefully wipe the fluid out of the battery compartment, then insert new batteries.

1. Open the battery compartment cover on the back of the remote control unit. Press the knob and open the cover in the direction of the arrow.



2. Insert the two R6P (AA) batteries, following the + and - marks in the battery compartment.



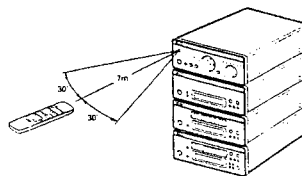
3. Close the cover of the battery compartment.



Using the Remote Control Unit

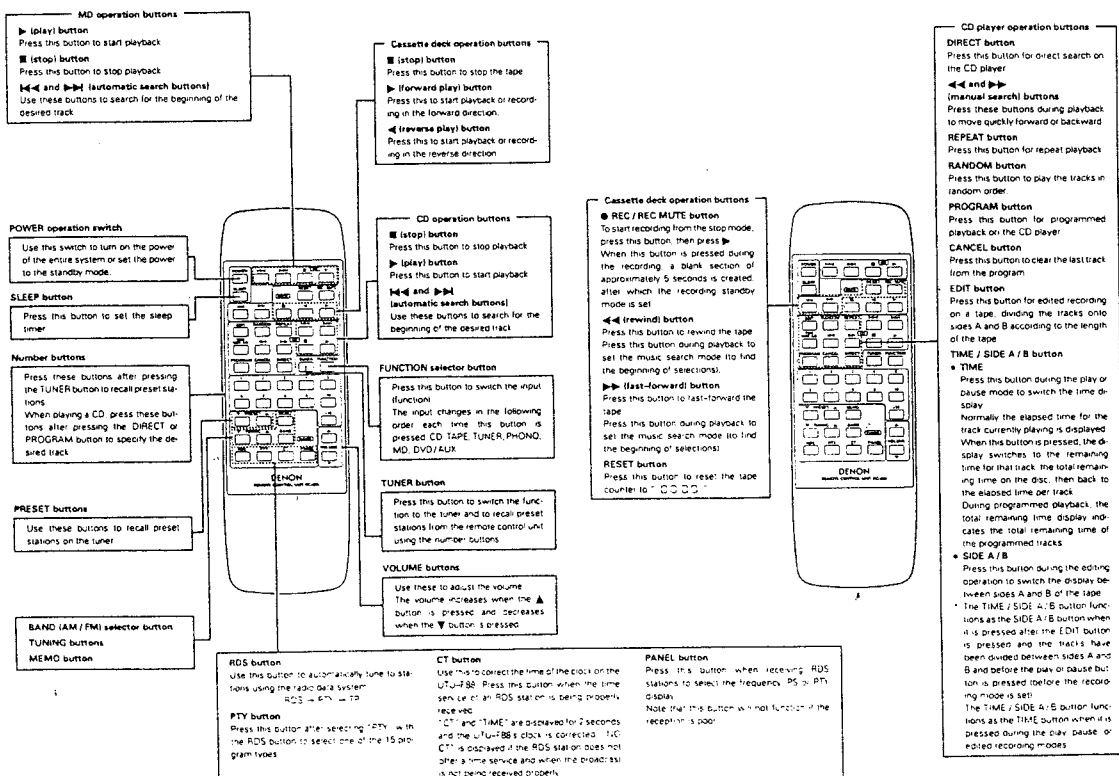
Cautions on Use

- The remote control unit may not operate if the remote sensor is exposed to direct sunlight or the strong light from a lighting fixture, or if there is an obstacle between the remote control unit and the remote sensor.
- Do not press buttons on the remote control unit and on the set at the same time. Doing so could result in malfunction.
- If the remote control unit is pointed away from the remote sensor during continuous operations (such as when turning the volume up or down), the operation will stop. If this happens, point the remote control unit at the remote sensor and press the button again.
- The remote control unit will only function when the pre-main amplifier's power is set to the on/standby mode. It will not function when the pre-main amplifier's power is turned off.



8

Remote Control Unit Part Names and Functions

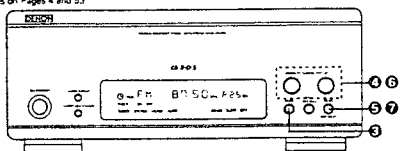


9

GENERAL SECTION

7 LISTENING TO RADIO PROGRAMS

(Check the connections on Pages 4 and 5.)

TUNING
FM 87.50 MHz

Example: Tuning in FM 87.50 MHz

LAMP stations are tuned in using the same procedure.)

1	Set the VOLUME control on the pre-main amplifier to the minimum position, then press the POWER switch to turn on the power.		
2	Turn the pre-main amplifier's INPUT SELECTOR control and select "TUNER".		
3	Press the BAND button on the tuner to select the FM band.		FM 80.00
4	Use the TUNING UP and DOWN buttons to tune the frequency to 87.50. Once the frequency is tuned in, adjust the volume to the desired level using the VOLUME control.		FM 87.50

Auto Tuning

- When one of the TUNING buttons is pressed, the frequency changes in steps of 50kHz in the FM band, 5kHz in the AM band.
- One of the TUNING buttons is held in for over 1 second, the frequency continues to change when the button is released (auto tuning) and stops when a station is tuned in. Tuning will not stop at stations whose reception is poor.
- To stop the auto tuning function, press the UP or DOWN button once.

Presetting AM and FM Stations

Example: Presetting FM 87.50 (currently tuned in) as preset number 3

5	Press the MEMO ENT/NEXT button. The MEMO indicator flashes for 10 seconds.		FM 87.50
6	Use the UP and DOWN buttons to call out the number at which you want to preset the station (3). Or simply press the corresponding number button (3) on the remote control unit.		FM 87.50
7	Press the MEMO ENT/NEXT button while the MEMO indicator is "1".		FM 87.50

2 to 30 AM or FM stations can be preset using this procedure.

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NOTES:

- In addition to the reception frequency, the reception mode (monaural or auto) is also preset, so check the display when presetting stations.
- If a station is preset at a number where a station is already preset, the previous station is "replaced" with the new station.
- The preset memory is not cleared immediately when the power cord is unplugged, but is cleared if the cord is left unplugged for an extended period of time. If this happens, preset the stations again.

Listening to Preset Stations

The preset stations can be recalled using the number buttons on the remote control unit.

Also, if the following operation is performed when the system power is off, the power automatically turns on and the radio is played (Auto on function).

Example: Listening to the station preset at number 3

(This operation is only possible from the remote control unit.)

1	Press the TUNER button on the remote control unit.		FM 87.50
2	Press button "3" on the remote control unit.		FM 87.50

Using the RDS functions

Receiving RDS broadcasts (FM only)

1	Press the BAND button and set the FM band.		FM 87.50
2	Press the RDS button once.		RDS
3	Press the AUTO TUNING UP (▲) or DOWN (▼) button.		FM 87.50
4	The station is tuned in.		RDS

NOTE: If no RDS station is found, "RD PROG" is displayed.

PTY Search

1	Press the RDS button twice.		PTY
2	Press the PTY button to select the type of program (one of the 15 types listed below can be selected).		NEWS
3	Press the AUTO TUNING UP (▲) or DOWN (▼) button.		FM 87.50
4	The station is tuned in.		PTY

NOTE: If no program of the specified type is found, "RD PROG" is displayed.

TP Search

1	Press the RDS button 3 times.		TP
2	Press the (▲) UP or DOWN (▼) button of AUTO TUNING.		FM 87.50
3	Broadcast reception.		TP

NOTE: "RD PROG" is displayed when there is no traffic information broadcast start or

Receiving FM programs in stereo

- Press the MONO/STEREO selector button to turn on the "AUTO" indicator. When a program being broadcast in stereo is received, the "STEREO" indicator lights and the program is received in stereo.
- If reception is poor and there is much noise in the stereo signal, press the MONO/STEREO selector button to set the monaural mode.

NOTE:

A humming sound may be heard when using a TV nearby while receiving AM programs. If this happens, move the system as far from the TV as possible.

Programs

NEWS	News	VARIETY	Variety
AFRICA	Africa	POP M	Pop Music
INFO	Information	ROCK M	Rock Music
SPORT	Sport	MOR M	MOR Music
EDUCATE	Education	LIGHT M	Light Music
DRAMA	Drama	CLASSICS	Classical Music
CULTURE	Culture	OTHER M	Other Music
SCIENCE	Science		

GENERAL SECTION

8 USING THE TIMER

The time and timer functions are incorporated in the tuner.

Timer Settings

■ Types of timer operations

- TIMER** Use this to turn the power on and off at the same times every day.
- SLEEP TIMER** Use this to set the power to turn off after 10 to 60 minutes, in steps of 10 minutes (operated from the remote control unit).

■ Notes on timer settings

- Be sure to set the current time beforehand.
- To listen to or record a radio program ("air check") using the timer, be sure to preset the station beforehand (Refer to "Presetting AM and FM Stations" on Page 10.)

Power Failures

Should there be a power failure or should the power cord be unplugged, the time display will flash at "00:00". If this happens, reset the current time.
Also check the timer and tuner presettings, and reset them if they have been cleared.

Checking the Settings

To check the timer settings, press the **TIMER/TIMER STANDBY** button for at least 3 seconds. (This can also be done when the tuner's power is off.) Next, press the **ENTER/NEXT** button repeatedly to display the timer start mode, the reception band and preset channel number when in the tuner mode, the on time and the off time. Press the **ENTER/NEXT** button once more to return to the current mode display.

Changing the Settings

Repeat the timer setting operation to erase the previous settings and set the new settings.

Clearing the Settings

Press the **TIMER/TIMER STANDBY** button for at least 3 seconds, then press it for at least 3 seconds again while "FUNC" is displayed to clear the timer settings.

Note on Setting the Timer

If the time set with the timer is reached while the system power is on, the operation switches to the operation set by the timer.

Turning the Timer Off

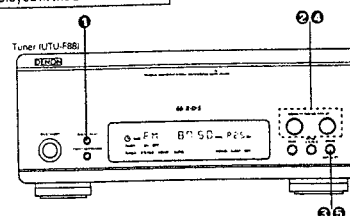
Press the **TIMER/TIMER STANDBY** button to turn the  mark off.

NOTE

- When the timer start time is reached while the power is on, the operation switches to the mode set with the timer.

Setting the Current Time

The time is displayed in the 24-hour mode.



Example: Setting to 19:30 (7:30 p.m.)

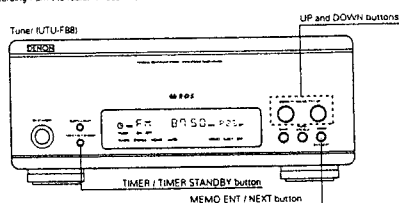
1	Press the CLOCK/DISPLAY button for at least 3 seconds.		 The hours place flashes. (If the hours have already been set, that number flashes.)
2	Use the UP and DOWN buttons to set the hours.		 The hours place flashes.
3	Press the MEMO ENT/NEXT button.		 The minutes place flashes. (If the minutes have already been set, that number flashes.)
4	Use the UP and DOWN buttons to set the minutes.		 The minutes place flashes.
5	Press the MEMO ENT/NEXT button at the sound of a time service's chime. The time display stops flashing and the clock starts running.		 The display stops flashing and the clock starts running from 00 seconds.

- The current time can be set even when the power is off.
- If an RDS station offers a time service, the time can be set by pressing the **CT** button on the remote control unit while that station is tuned in.

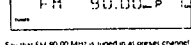
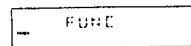
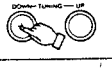
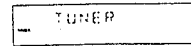
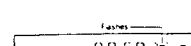
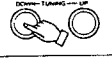
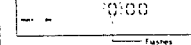
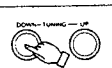
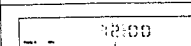
12

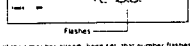
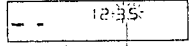
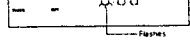
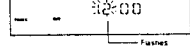
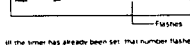
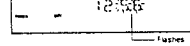
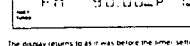
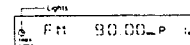
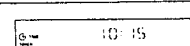
Setting the Timer

The power can be set to turn on and off every day at the same time in any of five modes: tuner, CD, cassette deck, MD player (optional) and air check (recording from the radio). (Preset the AM or FM station beforehand.)



Example: Setting the timer to turn on at 12:35, off at 12:56 (with FM 87.50 MHz preset at channel "3")

1	Press the POWER switch on the pre-main amplifier to turn on the system's power.		 Say that FM 90.00 MHz is tuned in at preset channel number "1".
2	Press the TIMER/TIMER STANDBY button for at least 3 seconds to set the timer setting mode.		
3	Use the UP and DOWN buttons to set the "TUNER" mode.		
4	Press the MEMO ENT/NEXT button.		 The minutes place flashes.
5	Use the UP and DOWN buttons to set the preset channel number.		 The minutes place flashes.
6	Press the MEMO ENT/NEXT button.		 The minutes place flashes.
7	Use the UP and DOWN buttons to set the hours for the timer on time.		 The hours place flashes.

8	Press the MEMO ENT/NEXT button.		 The minutes place flashes. (If the timer has already been set, that number flashes.)
9	Use the UP and DOWN buttons to set the minutes for the timer on time.		 The minutes place flashes.
10	Press the MEMO ENT/NEXT button.		 The minutes place flashes.
11	Use the UP and DOWN buttons to set the hours for the timer off time.		 The hours place flashes.
12	Press the MEMO ENT/NEXT button.		 The minutes place flashes. (If the timer has already been set, that number flashes.)
13	Use the UP and DOWN buttons to set the minutes for the timer off time.		 The minutes place flashes. (If the timer has already been set, that number flashes.)
14	Press the MEMO ENT/NEXT button.		 The display returns to as it was before the timer setting mode was set.
15	Press the TIMER/TIMER STANDBY button.		 The display returns to as it was before the timer setting mode was set.
16	Press the POWER operation switch on the remote control unit (RC-630) and set the system's power to the standby mode.		

If the  mark is displayed after the **TIMER/TIMER STANDBY** button is pressed the timer will operate at the same times every day. To turn the timer off, press the **TIMER/TIMER STANDBY** button again to turn the  mark off.

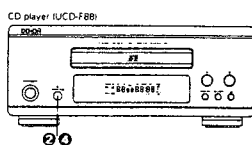
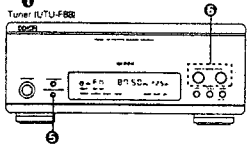
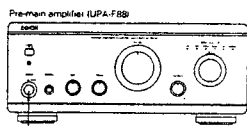
NOTES

- The standby mark  will not light if the current time is not set. If this is the case, set the current time, then press the **TIMER/TIMER STANDBY** button.
- The timer will not function when the pre-main amplifier's power is turned off.

13

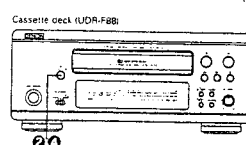
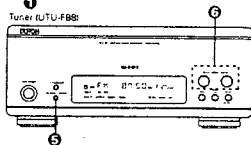
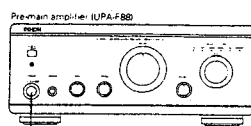
GENERAL SECTION

Various Timer Operations



Example 1: Playing a compact disc with the timer

1	Press the POWER switch on the pre-main amplifier to turn on the system's power.		
2	Press the CD player's OPEN/CLOSE button to open the disc tray.		
3	Load the disc in the disc tray. Refer to Page 20.		
4	Press the CD player's OPEN/CLOSE button again to close the disc tray.		
5	Press the tuner's TIMER/TIMER STANDBY button for at least 3 seconds.		
6	Use the tuner's UP and DOWN buttons to set the "CD" mode.		
7	Now follow steps 6 to 16 under "Setting the Timer" on Page 13.		

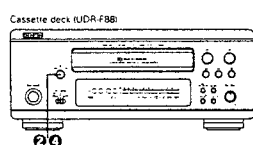
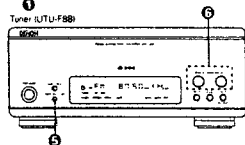
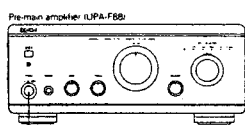


Example 2: Playing a cassette tape with the timer

1	Press the POWER switch on the pre-main amplifier to turn on the system's power.		
2	Press the cassette deck's OPEN/CLOSE button to open the cassette tray.		
3	Load the cassette tape in the cassette tray. Refer to Page 16.		
4	Press the cassette deck's OPEN/CLOSE button again to close the cassette tray.		
5	Press the tuner's TIMER/TIMER STANDBY button for at least 3 seconds.		
6	Use the tuner's UP and DOWN buttons to set the "TAPE" mode.		
7	Now follow steps 6 to 16 under "Setting the Timer" on Page 13.		

* Check that the direction of tape have reverse mode and Dolby NR mode are set as desired.

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Example 3: Unattended recording of radio programs ("air check")

1	Press the POWER switch on the pre-main amplifier to turn on the system's power.		
2	Press the cassette deck's OPEN/CLOSE button to open the cassette tray.		
3	Load the cassette tape in the cassette tray. Refer to Page 16.		
4	Press the cassette deck's OPEN/CLOSE button again to close the cassette tray.		* For instructions on setting the reverse mode and Dolby NR mode refer to 2 and 3 on Page 19.
5	Press the tuner's TIMER/TIMER STANDBY button for at least 3 seconds.		
6	Use the tuner's UP and DOWN buttons to set the "AIRCH" mode.		
7	Now follow steps 6 to 16 under "Setting the Timer" on Page 13.		

- * Check that the direction of tape have reverse mode and Dolby NR mode are set as desired.
- * Timer recording starts in the direction indicated on the cassette tape.
- * Recording is not possible on the leader tape at the beginning of the cassette tape, so to avoid missing any of the program, we recommend setting the timer to approximately 1 minute before the program is scheduled to start.

Setting the Sleep Timer

With this function, the power can be set to turn off after 10 to 60 minutes, in steps of 10 minutes, using the remote control unit.

Example: Setting the power to turn off in 50 minutes.
(This operation is only possible from the remote control unit.)

1	Tuner currently set to FM 87.50 MHz	
2	Press the SLEEP button	
3	Press the SLEEP button again while the "SLEEP" indicator is flashing	
4	The previous display reappears after 5 seconds. The "SLEEP" indicator remains lit, indicating that the sleep timer is functioning.	

- * The time is reset to "60" (60 minutes) if the SLEEP button is pressed again while the sleep timer is functioning.

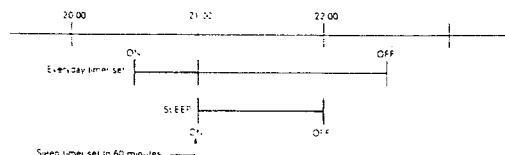
Cancelling the Sleep Timer

Press the SLEEP button repeatedly until the "SLEEP" indicator turns off. The sleep timer is also cancelled if the amplifier's POWER switch or the POWER operation switch on the remote control unit is pressed turning the system power off.

NOTE
* If the times set with the sleep and everyday timers overlap, the sleep timer has priority.

Order of priority of the sleep and everyday timers

The sleep timer has priority for the off time. (The system operates as indicated by the diagram.)



Even when the power is turned on with the timer, the power turns off when the time of the sleep timer reaches "00" before the off time set with the everyday timer is reached. If the everyday timer is reached while the sleep timer is functioning, the everyday timer does not function.

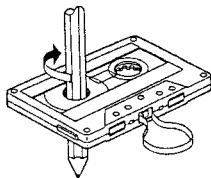
GENERAL SECTION

9 BEFORE RECORDING AND PLAYING TAPES

About Cassette Tapes

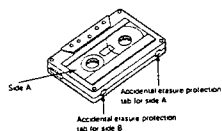
■ Cautions on handling cassette tapes

- C-120 cassette tapes
C-120 (120-minute) cassettes use very thin tape which can easily get caught on the capstans and pinch rollers. We recommend not using C-120 tapes.
- Tape slack
If the tape is slack, it may get caught in the mechanism and damaged. Take up any slack in the tape with a pencil, etc., before loading the cassette.



■ Preventing accidental erasure

- Cassette tapes have tabs for preventing accidental erasure. Use a screwdriver, etc., to break off the tabs to prevent recordings from being accidentally erased.
- To record on a tape whose tabs have been broken, place a piece of cellophane tape, etc., over the tab holes.



■ Notes on storing cassette tapes

- Avoid placing cassette tapes in the following types of places:
 - Hot or humid places
 - Dusty places
 - Places exposed to direct sunlight
 - Near magnetic sources (TVs, speakers, etc.)
- Store cassette tapes in cases with stoppers to prevent the tape from getting stuck.

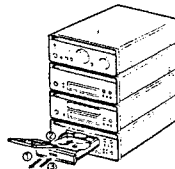
Loading and Unloading Cassette Tape

NOTE

- Load cassette tapes with the side on which the tape is exposed facing the set. Loading them the other way may result in damage.

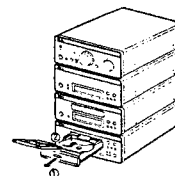
■ Loading

1. Press the OPEN/CLOSE button. The cassette tray opens.
2. Load the cassette tape in the cassette tray as shown on the diagram below, with the side on which the tape is exposed facing inside.
3. Press the OPEN/CLOSE button to close the cassette tray.



■ Unloading

1. Press the OPEN/CLOSE button. The cassette tray opens.
2. Remove the tape.



Check the following before recording or playing cassette tapes.

1. Are the heads dirty?
2. Are the accidental erasure protection tabs broken off?

The sound quality will be poor if the heads are dirty.

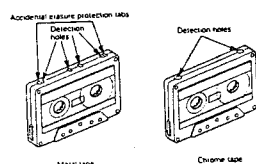
Refer to Page 25.

Recording is not possible if the accidental erasure protection tabs on the top of the cassette are broken off.
Refer to Page 16.

Auto Tape Selector Mechanism

The D-F88 is equipped with an auto tape selector mechanism which uses the detection holes in the cassette halves to detect the type of tape and automatically set the most appropriate recording bias and equalization for that type of tape.

- Do not use ferrichrome tapes.
- When an old metal tape with no detection holes is used, the treble will be stressed excessively, so use metal tapes with detection holes.



16

Using the Auto Reverse Function

This deck is equipped with an auto reverse function, so the tape can be played or recorded on both sides or played continuously without removing the cassette.

■ Direction of tape travel

This deck is equipped with two play buttons, one for the forward direction (front side) and one for the reverse direction (back side). If the button for the opposite direction is pressed during playback, playback switches to the other side.

The front side is the side facing up when the tape is loaded in the cassette tray.

■ Reverse mode

There are three reverse modes, as described below. For instructions on switching between them, refer to Page 17, 18.

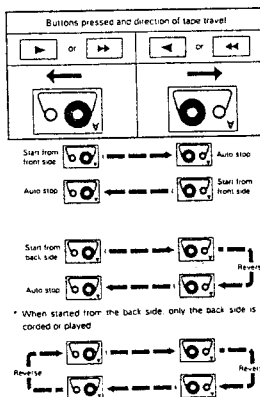
- Single-sided recording/playback mode ()
Use this to record or play only the front or back side. (The stop mode is set automatically when the end of that side of the tape is reached.)

• Double-sided recording/playback mode ()

- In this mode, when the end of the front side of the tape is reached during recording or playback, the tape automatically switches to the back side and playback or recording continues. (The stop mode is set automatically when the end of the tape on the back side is reached.)

• Continuous play mode ()

- In this mode, playback continues until the stop button is pressed.



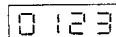
When started from the back side, only the back side is recorded or played.

During recording, the deck automatically operates in the same way as for the double-sided recording/playback mode ().

Using the Tape Counter

■ Tape counter

The D-F88's tape counter indicates the tape's elapsed time as the continuous number.

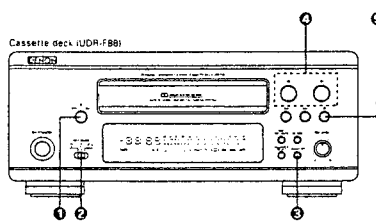


- The counter is reset to "0000" when a new tape is loaded and when the RESET button is pressed.
- If you make notes on the number on the counter and the recorded content while recording or playing tapes, these notes can be used to easily find the section you want to play or record.

17

GENERAL SECTION

10 PLAYING CASSETTE TAPES (single-sided, double-sided and continuous playback)



The [R] mark indicates operations which can also be performed on the remote control unit.

1	Press the OPEN/CLOSE button and load a recorded tape in the cassette tray. Refer to Page 16.	
2	Slide the REV. MODE selector switch. Refer to Page 17.	
3	Press the DOLBY NR button to display the Dolby mode. Refer to Page 8.	
4	Press the play button ▶ or ◀ . [R]	
5	To stop playback, press the stop button ■ . [R]	

Fast-forwarding and rewinding

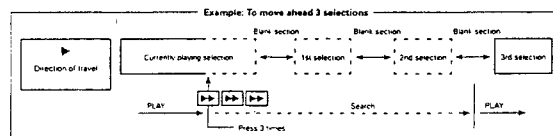
1	When listening to the front side (when ▶ is lit)	Press the stop button ■ . Direction of travel: To scan backward (◀) or To scan forward (▶).
2	When listening to the back side (when ◀ is lit)	Press the stop button ■ . Direction of travel: To scan forward (▶) or To scan backward (◀).

Using the Music Search Function (automatically finding the beginning of selections)

- Use this function to move back to the beginning of the current selection or forward to the beginning of the following selection.
- This function can also be used to skip over selections (up to 99 selections in either direction).

1	When listening to the front side (when ▶ is lit)	To move to the beginning of the current selection: Press once. To move back five selections: Press five times.
2	When listening to the back side (when ◀ is lit)	To listen to the following track: Press once. To return to the track five tracks forward: Press five times.

- To fast-forward or rewind the tape, first press the stop **■** button, then press the **▶** or **◀** button.
- The music search function will only work if there are blank sections of at least 4 seconds between selections.



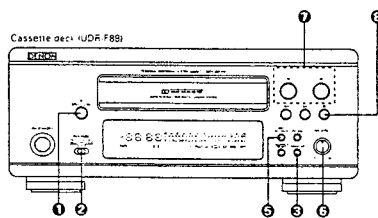
Music Search Display

- When a selection before the current selection is specified: **P-03** (Number of selections to be skipped)
- When a selection after the current selection is specified: **P 05** (Number of selections to be skipped)

During the music search function the number of selections to be skipped is displayed on the tape counter, and decreases each time a blank section is detected. (For example, **P-05** → **P-04** → **P-03** when moving 3 selections ahead.) The tape counter reappears when the operation is completed.

18

11 RECORDING CASSETTE TAPES



- Before recording on a cassette tape, check that its accidental erasure protection tabs are intact. Recording is not possible if the tabs are broken off.
- The positions of the **VOLUME**, **TREBLE** and **BASS** controls on the pre-main amplifier do not affect the recording.

The [R] mark indicates operations which can also be performed on the remote control unit.

1	Press the OPEN/CLOSE button and load the tape onto which you want to record in the cassette tray. Refer to Page 16.	
2	Slide the REV. MODE selector switch to the RE or FF position. Refer to Page 17.	
3	Press the DOLBY NR button to display the Dolby mode. Refer to Page 8.	

To record the radio	To record from the component connected to the AUX terminals	To record a CD
4 Turn the pre-main amplifier's INPUT SELECTOR control and select "TUNER". Tune in the station to be recorded. Refer to Page 10.	Turn the pre-main amplifier's INPUT SELECTOR control and select "DVD/AUX". Starting playback on the DVD player, video deck or LD player.	Load the disc in the CD player. Refer to Page 20.
5 Press the REC/REC MUTE button.	Press the REC/REC MUTE button.	Press the CD player's play button to start playback.
6 Adjust the recording level.	Adjust the recording level.	For synchronized recording of CDs: Press the stop buttons on the CD player and cassette deck, then press the CD SRS button.
7 Press the play button ▶ or ◀ (Recording starts). "PLAY" appears on the display.	Press the play button ▶ or ◀ (Recording starts). "PLAY" appears on the display.	"CD SRS" appears on the display (Recording starts). When the CD SRS button is pressed, a blank section of 9 seconds is automatically created before recording starts. CD SRS recording starts in the direction of travel indicated on the display: ▶ or ◀ . So press the ▶ or ◀ button to switch to the desired direction after loading the tape, then press the stop ■ button to set the desired direction for CD SRS recording.
8 To stop recording, press the stop button ■ .	To stop recording, press the stop button ■ .	To stop recording, press the stop button ■ .

- If the CD player's play button is pressed in the recording pause mode, recording of the CD begins automatically.
- The CD SRS function will not work if the CD player is set to the random play or program mode.

Adjusting the REC LEVEL Control

The recorded sound will be distorted if the recording level is too high, or there will be much noise if the recording level is too low. It is important to set the recording level to an appropriate setting to achieve a good quality recording.

- Watch how far the level meter lights and adjust the **REC LEVEL** control accordingly.

Optimum recording input level (approximate)

Type-I (normal) tapes	Meter lights up to 0dB
Type-II (IC) tapes	Meter lights up to +10dB
Type-IV (metal) tapes	Meter lights up to +10dB

NOTES

- The actual recording level differs depending on the source and the type of tape, so make a trial recording first to check the recording level.
- Record with the recommended recording level, then over the input level if there is distortion in the recorded sound.

GENERAL SECTION

12 PLAYING CDs

About Compact Discs



Only discs with the mark shown left can be played on the D-F88.

Use compact discs that include the mark. CD's with special shapes (heart-shaped CD's, octagonal CD's, etc.) cannot be played on this set. Attempting to do so may damage the set. Do not use such CD's.



• For CD's, only the audio part is played. (The video part is not played.)

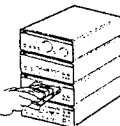
■ Removing discs from their cases

As shown on the diagram, grasp the outer edge of the disc with your fingers, insert a finger in the center hole, press gently, then lift the disc out of the case.



■ Loading discs in the disc tray

Be sure to load the disc with the labelled side facing up. (Compact discs only play on one side.) For 8cm CD's, set the disc in the center section in the center of the tray.

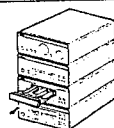


NOTES:

- The disc tray opens when the OPEN/CLOSE button is pressed once and closes when it is pressed again.
- When the disc tray is closed, the disc turns automatically for several seconds, then the total number of tracks and total playing time of that disc appear on the display.
- The disc tray can also be closed by pressing the play button (▶) in which case playback automatically starts from the first track on the disc (or if tracks are programmed, from the first programmed track).

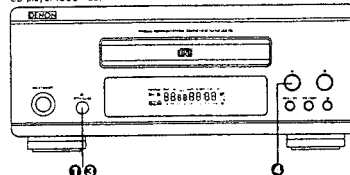
Handling the Disc Tray

Do not turn off the power, stop the disc tray by hand or pull it when it is moving. Doing so may damage it. If the headphones, cord or some other object accidentally gets caught in the disc tray while it is closing and the disc tray stops, press the OPEN/CLOSE button again to open the tray and remove the obstacle. Do not set objects other than discs on the disc tray. Doing so may damage it.



Normal Playback

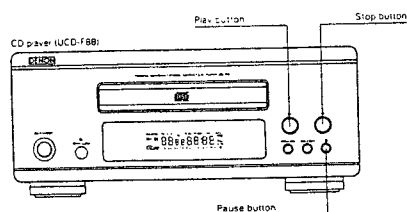
CD player (UCD-F88)



Example: Playing a disc containing 15 tracks and with a playing time of 62 minutes, 02 seconds, starting from the first track.

The [R] mark indicates operations which can also be performed on the remote control unit.		
1	Press the OPEN/CLOSE button to open the disc tray.	OPEN
2	Load the CD in the disc tray.	
3	Press the OPEN/CLOSE button. The disc tray closes. The display appears after several seconds.	15 62:03
4	Press the play button (▶) [R].	01:00:01

20



Interrupting playback temporarily

Press the pause button ().		The " " mark appears on the display and playback stops at the point where the button was pressed.
------------------------------	--	--

Resuming playback

Press the play button (▶).	[R]	The " " mark turns off on the display, and playback resumes from the point where the pause button was pressed.
----------------------------	-----	---

Stopping playback

Press the stop button (■).	[R]	
----------------------------	-----	--

NOTES

- When a disc is loaded, "15 62:03" is displayed on the display for several seconds while the data of the number of tracks and total playing time is being read from the innermost side of the disc, after which the number of tracks and total playing time appear.
- If no disc is loaded, if the disc is upside down, or if the data cannot be read (because of scratches or dirt), the display reads as shown below and the disc will not play.

disc

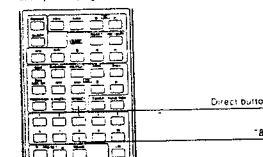
Various Playback Functions

In addition to the regular playback, the D-F88 also offers the following playback functions.

① Playing a specific track Direct Search

(Using the remote control unit)

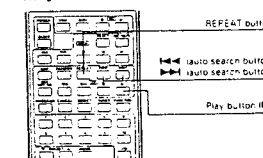
Example: Playing the 8th track



- 1 Press the DIRECT button.
- 2 Press the button corresponding to the number of the track. "8" appears on the track number display and playback of track number 8 begins.
- When the end of the track is reached, playback continues on the next track.
- To specify a track number of 11 or greater, say track 15, press then , and to specify a track number of 20 or greater, say track 23, press then .
- To play track 20, press then .

② Playing a single track repeatedly Single-track Repeat

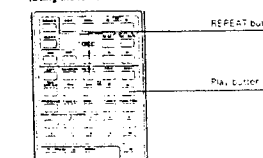
(Using the remote control unit)



- 1 When the REPEAT button is pressed once, REPEAT appears on the display and the single-track repeat mode is set.
- 2 Use the and buttons to select the track to be repeated.
- 3 Press the play button (▶) to start playback.
- When the end of the specified track is reached, playback starts over from the beginning of that track.
- The single-track repeat mode can also be set by pressing the REPEAT button once during playback.
- To cancel the single-track repeat mode, press the REPEAT button repeatedly until the "REPEAT" indicator turns off.

③ Playing all the tracks repeatedly All-track Repeat

(Using the remote control unit)



- 1 When the REPEAT button is pressed twice, REPEAT appears on the display and the all-track repeat mode is set.
- 2 Press the play button (▶) to start playback.
- The all-track repeat mode can also be set by pressing the REPEAT button twice during playback.
- To cancel the all-track repeat mode, press the REPEAT button to turn the "REPEAT" indicator off.
- If the REPEAT button is pressed during programmed playback, the tracks are played repeatedly in the programmed order.

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GENERAL SECTION

① Playing a certain section repeatedly

A-B Repeat

Example: Using a CD containing 15 tracks

1st press	(1) When pressed during playback 	The single-track repeat mode is set and "REPEAT" and "ONE" light.
	(2) When pressed before playback 	The single-track repeat mode is set and "REPEAT" and "ONE" light. Next: ① Press the play button (▶) to play the first track repeatedly. ② If playback is started using the direct search buttons on the remote control unit or the <<< and >>> buttons on the CD player, the specified track is played repeatedly.
2nd press	(1) When pressed during playback 	The all-track repeat mode is set and "REPEAT" and "ALL" light.
	(2) When pressed before playback 	The all-track repeat mode is set and "REPEAT" and "ALL" light. Then press the play button (▶) or direct search buttons on the remote control unit to play.
3rd press	When pressed during playback 	"REPEAT" and "A-B" light.
	When pressed during playback 	"REPEAT" and "A-B" light, and the section between points A and B is played repeatedly.

Press the REPEAT button again to return to normal playback.

② Playing the tracks in a certain order

Programmed Playback

(Using the remote control unit)

Example: Programming the 3rd track to play first, the 18th track to play second, using a CD containing 18 tracks and with a playing time of 62 minutes, 03 seconds

Procedure

1	Press the PROGRAM button	
2	Press "3" to set the 3rd track at the first place in the program	 After 2 seconds -- P-02 display when the 3rd track is set at the first place
3	Press "18" to set the 18th track at the second place in the program	 After 2 seconds -- P-03 display when the 18th track is set at the second place
4	Press the play button (▶)	The tracks are played in the programmed order

- When the TIME button is pressed before playback, the total playback time of programmed tracks is displayed.
- Press the DIRECT button to resume normal playback during the programmed playback.
- To cancel the entire program, press the DIRECT button or cancel the program one by one using the CANCEL button.
- If you want to correct the programmed track, press the automatic/manual search reverse button (◀◀) to display the track to correct and press the desired number button on the remote control unit. Press the CANCEL button instead of the number button to cancel the displayed track. After finishing the correction, press the automatic/manual forward button (▶▶) repeatedly until "---" is displayed on the track number display.

Other operations possible during programmed playback:

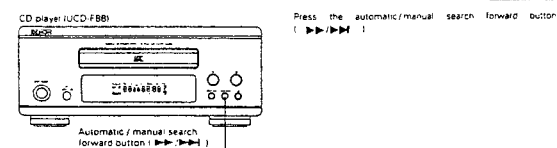
Such operations as quick search, pause and skip monitor are also possible during programmed playback. For the quick search function, press the automatic/manual search reverse button (◀◀) to move back to the beginning of the track, then press it again while the time display reads "00:00" to move back to the beginning of the preceding track. To move ahead to the beginning of the next track, press the automatic/manual search forward button (▶▶) regardless of the time display.

NOTES:

- The numbers of the programmed tracks on the music calendar turn off after the tracks have been played.
- With this CD player, up to 20 tracks with any track number between 1 and 99 can be programmed.
- If a number greater than the total number of tracks on the disc is specified, that number will not be displayed.
- Programming is also possible with the disc tray open. In this case it is possible to program a track number not included on the disc, but when the program is played, that track number will be skipped.
- The entire program is canceled when the OPEN/CLOSE button is pressed.
- If you make a mistake when programming, press the CANCEL button to cancel the mistake. (The last track in the program is canceled each time the CANCEL button is pressed.)
- The A-B repeat functions do not work during programmed playback.
- Set the stop mode when canceling tracks from the program.

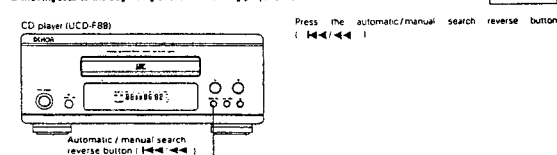
③ Moving ahead to the next track during playback

Quick Search



④ Moving back to the beginning of the track during playback

Quick Search

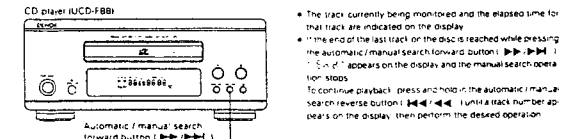


⑤ Finding a certain spot on the disc while listening to the sound

Skip Monitor

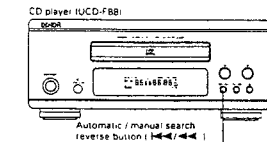
- Use this function to skip through the disc while listening to the sound.
- When the desired spot is reached using the skip monitor function, release the automatic/manual search forward button (▶▶) or automatic/manual search reverse button (◀◀) to resume normal playback from that point.

(1) Forward skip monitor



During playback, press and hold in the automatic/manual search forward button (▶▶) to skip through the disc in the forward direction while listening to the sound.

(2) Reverse skip monitor



During playback, press and hold in the automatic/manual search reverse button (◀◀) to skip through the disc in the reverse direction while listening to the sound.

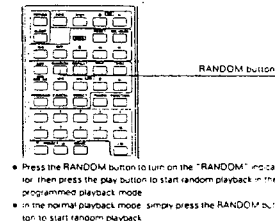
If the automatic/manual search forward or automatic/manual search reverse button is pressed during programmed playback then released at a track not in the program, instantly the next track in the program is searched and played.

⑥ Playing the tracks in random order

Random Playback

(Using the remote control unit)

- Use this function to play all the tracks on the disc once in random order.



- The programmed tracks can be played in random order by pressing the RANDOM button when tracks are programmed.
- If the RANDOM button is pressed while the repeat mode is set, the tracks are each played once in random order, then played again in another order, and so on.
- Random playback cannot be set in the A-B repeat mode.
- While the next track is being searched for, any numbers of the tracks on the disc are not displayed on the track number display so it is not possible to know which track will be played next.
- The repeat mode is set to the all-track repeat mode when the RANDOM button is pressed during the single-track repeat mode.

NOTES:

- The total remaining time cannot be displayed during the random playback mode.
- The random playback mode cannot be set during editing.

GENERAL SECTION

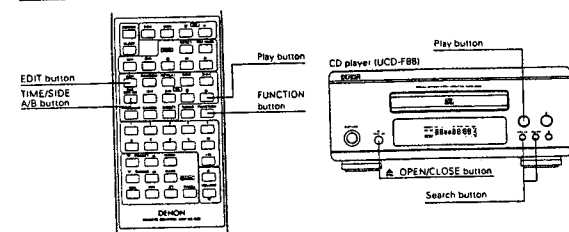
Edited Recording on Sides A and B of a Tape

This function allows edited recording according to the size of the tape. (This operation is only possible from the remote control unit.)

- Use this function to efficiently edit the tracks on a CD according to the length of the tape onto which you want to record.

NOTES:

- In the edited recording mode, it is programmed so that the remaining time of the tape becomes minimum and the last programmed track may be out of line on both sides. If you want to make serial track recording in the case, use the CD SRS button after stopping the edited recording mode. Refer to Page 15.
- Load the cassette tape onto which you want to record in the cassette deck with side A on the top before starting the editing procedure. The tape is automatically wound to the beginning before recording starts.
- The editing mode is cancelled when the CD player's stop button is pressed.
- Note that even if the tape is slightly longer than the disc's total playing time, it may not be possible to record all the tracks on sides A and B because of the combination of tracks to be recorded on the different sides of the tape.
- When recording on an already recorded tape, if the tape is longer than the new recording, the previous recording will remain at the end of side B, so erase the tape before starting.
- To protect the recording, do not turn the INPUT SELECTOR (function) knob during edited recording.
- During edited recording, only the stop button, POWER operation switch, and TIME button for the CD player and the RESET button, stop button, DOLBY NR button, and POWER operation switch for the cassette deck will function.
- Blank sections of 4 seconds are automatically created between all the selections to make it easier to search for selections on tapes recorded on the system. Since this differs from the actual time between tracks on the CD, the displayed time and the actual remaining time on the tape differ slightly.
- During edited recording, if the disc's reverse mode is set to $\rightarrow$, it automatically switches to the $\rightarrow$ mode and side B is recorded.
- The total remaining time cannot be displayed during the programmed edited recording.



Recording the tracks in the same order as on the disc

Automatic Edited Recording

Example: Recording a disc containing 16 tracks and a total playing time of 56 minutes on a C-60 cassette tape

1	Press the CD player's OPEN/CLOSE button to open the disc tray. Load the disc in the disc tray.		OPEN
2	Press the OPEN/CLOSE button to close the disc tray. The display appears after several seconds.		16 56:00

3	Press the FUNCTION button on the remote control unit or the pre-main amplifier to set the CD mode.		Load the cassette tape onto which you want to record in the cassette deck with side A facing up.
4	Press the EDIT button on the remote control unit to set the length of the tape. (The length is the total for sides A and B.) For a 60-minute C-60 tape, press the EDIT button 4 times.		The display changes as shown below each time the EDIT button is pressed. (If the tape length has already been set once, the display changes starting from that length.) Example: For a 60-minute tape Ed C 60 2 minutes 40 seconds remaining on side A Ed 02:40 Side A display - Tracks 1 to 9 will be recorded on side A Ed 01:20 Side B display Track no. Elapsed time 1 11 55 10 3
5	Press the TIME/SIDE A/B button on the remote control unit. The display switches between sides A and B each time the button is pressed.		
6	Press the play button on the remote control unit or the CD player.		
7	The tape is automatically wound to the beginning of the cassette deck, then recording starts.		

Recording the tracks in a specific order

Programmed Edited Recording

- Program the desired tracks as described in "Programmed Playback" on Page 22.
- Follow steps 4 to 6 for automatic edited recording.

TROUBLESHOOTING

Check the following once more before assuming there is a problem with the system.

1. Are connections proper?

2. Is the system being operated as explained in the operating instructions?

If the system does not seem to be operating properly, check as shown on the table below. If none of these checks apply to the problem, the system may be malfunctioning. Disconnect the power cord immediately and contact your store of purchase.

Symptom	Cause	Countermeasure	Page
Power does not turn on when power switch is pressed	Power cord is not plugged into a power outlet	Plug the power cord securely into an outlet	5
No sound is produced from the speakers	VOLUME control is turned down	Set the control to an appropriate position	6
	Headphones are connected	Disconnect the headphones	6
	Speaker cords are not securely connected	Connect securely	5
No audible sound is produced, or the position of the instruments is unclear	Speaker positions (L and R) are inverted	Connect the speaker cords properly	5
A sound other than the desired one is heard	Function is not properly set	Set the desired function using the INPUT SELECTOR control	6
Remote control unit does not work	Pre-main amplifier unit's power is not on	Set the POWER switch to the "ON" position	3
	Batteries are not properly inserted	Insert the batteries properly	8
	Batteries are spent	Replace the batteries with new ones	8
Recording does not start when REC/REC MUTE button is pressed	No cassette tape is loaded	Load a cassette tape	16
	Accidental erasure protection tabs are broken off	Cover the tab holes with opaque tape	6
Sound is broken or no sound is produced during recording and playback	Heads are dirty	Clean the heads	25
	Cassette tape is defective	Replace the cassette tape	-
Humming sound is heard while playing cassette tapes	Noise from a TV	Move the TV away from the system	4
	Noise may be produced by some types of TVs	Turn the TV off	-
Wow (bary) sound is heard during recording or playback	Captions or punch holes are dirty	Clean them	15
Humming sound is heard in FM programs	Antenna direction is poor	Change the direction of the antenna	4
	Signals from the broadcast station are weak	Insert an outdoor antenna	4
Humming sound is heard in AM programs	Noise from a TV or interference from a broadcast station	Turn the TV off	-
	Change the direction of the loop antenna	Insert an outdoor antenna	4
Humming sound is heard in AM programs	Signals on the power cord are being modulated by the power source frequency	Insert the power cord in the opposite direction	4
		Insert an outdoor antenna	4
Total number of tracks not displayed when disc is loaded	Disc is loaded upside-down	Reload the disc	10
	Disc is dirty	Clean the disc	20
	Disc is not of the specified type	Replace with a disc of the specified type	-
Humming, humming when operating buttons are pressed	Disc is loaded upside-down	Reload the disc	20
	Foreign object on disc tray	Remove the disc and the foreign object	20
Disc stops in the middle of a track and will not play properly	Disc is dirty	Clean the disc	20
	Disc is scratched	Replace with an unscratched disc	-
Sound is broken	Dirt, fingerprints, spots, etc. on disc	Clean the disc	20
	Disc is scratched	Replace with an unscratched disc	-
	Player is in an unstable place and vibrates strongly	Place the player in a stable place with no vibrations	-
Humming sound is heard when disc is played	Signals on the power cord are being modulated by the power source frequency	Insert the power cord in the opposite direction	4

13 AUTO ON FUNCTION

- When the play button or OPEN/CLOSE button on the CD player or cassette deck is pressed while the power is set to the standby mode, the power automatically turns on and the play or open/close operation is performed.
- In the same way, when the tune preset/up/down buttons on the remote control unit is pressed, the power turns on and the corresponding station is tuned in.

14 OTHER INFORMATION

Cleaning the Heads

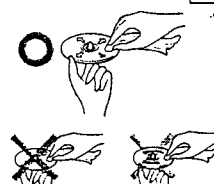
- If the cassette deck's heads are dirty, tapes cannot be played or recorded with good sound quality.
- To take full advantage of all the performance this cassette deck has to offer and ensure good quality sound, clean the heads periodically after approximately 10 hours of use, using a commercially available cleaning cassette.

NOTE
Some commercially available cleaning cassettes are highly abrasive and may damage the heads. Avoid using such cleaning cassettes.

Demagnetizing the Heads

- The heads become magnetized after they have been used for an extended period of time or if they are exposed to a magnetic object. This results in noise or a loss of the treble sound.
- If the heads are magnetized, use a commercially available cassette-type head demagnetizer to demagnetize them.

Cleaning Discs



Dust, fingerprints or spit on the disc will result in noise or skipping. If the disc is dirty or if the CD player does not operate properly, use the following procedure to clean the disc:
• Hold the disc with the label surface (the side opposite the label) facing up, as shown in the diagram.
• Wipe the disc gently from the center towards the edge in the direction of the arrow with a soft cloth.

- Do not clean discs with the following:
• Solvents, alcohol or other solvents
• Cleaners including an abrasive
• Soft or coarse brushes designed for records
• Air blower

NOTES:

- Do not wipe discs in the direction opposite the arrow or in a circular motion as with regular records.
- The disc's signal surface is easily damaged, so do not wipe it with a hard cloth or rub it strongly.

15 SPECIFICATIONS

■ Pre-main amplifier (UPA-FBB) Rated output power: Low frequency adjustment range: High frequency adjustment range: Audio input/output jacks: Power supply: Power consumption: Maximum external dimensions: Weight:	45 W + 45 W (4 Ω / ohms, DIN) 100 Hz ± 8 dB 10 kHz ± 8 dB FM 1.5 μV / 75 Ω / ohms AM 20 μV 35 dB (1 kHz) AC 230 V, 50 Hz 120 W 270 mm × 112 mm × 330 mm (10-5/8" × 4-1/2" × 12-3/4") (including feet, controls and terminals) 5.3 kg (11 lbs 4 oz)
■ Tuner (UTU-FBB) Reception frequency band: Reception sensitivity: FM stereo separation: Power supply: Power consumption: Maximum external dimensions: Weight:	FM 87.50 MHz - 108.00 MHz AM 522 kHz - 1611 kHz FM 1.5 μV / 75 Ω / ohms AM 20 μV 35 dB (1 kHz) AC 230 V, 50 Hz 10 W 270 mm × 112 mm × 297 mm (10-5/8" × 4-1/2" × 11-45/64") (including feet, controls and terminals) 2.6 kg (5 lbs 15 oz)
■ CD player (UCD-FBB) Wow & flutter: Sampling frequency: Optical source: Power supply: Power consumption: Maximum external dimensions: Weight:	Below measurable limits (± 0.001% W, peak) 44.1 kHz Semiconductor AC 230 V, 50 Hz 10 W 270 mm × 112 mm × 297 mm (10-5/8" × 4-1/2" × 11-45/64") (including feet, controls and terminals) 3.1 kg (6 lbs 13 oz)
■ Cassette deck (UDR-FBB) Type: Heads: Tape speed: Included circuits: Usable tapes: Power supply: Power consumption: Maximum external dimensions: Weight:	Horizontal 4-track 2-channel stereo auto reverse cassette deck 1 hard permanent recording (slabback) head 1 double-gap ferrite erasing head 4.75 cm/s C60, C90, C120, D60, D90, HX Pro Normal, chrome and metal AC 230 V, 50 Hz 14 W 270 mm × 112 mm × 305 mm (10-5/8" × 4-1/2" × 12-1/16") (including feet, controls and terminals) 3.7 kg (8 lbs 3 oz)
■ Remote control unit (RC-430) Remote control system: Number of buttons: Power supply: Maximum external dimensions: Weight:	Infrared pulse 51 Two DC 1.5V R6P/AA batteries 64 mm × 155 mm × 40 mm (2-1/2" × 6-1/8" × 1-5/8") 130 g (including batteries) (approx. 4.6 oz)

* Maximum dimensions include controls, jacks and covers.

(W) = width (H) = height (D) = depth

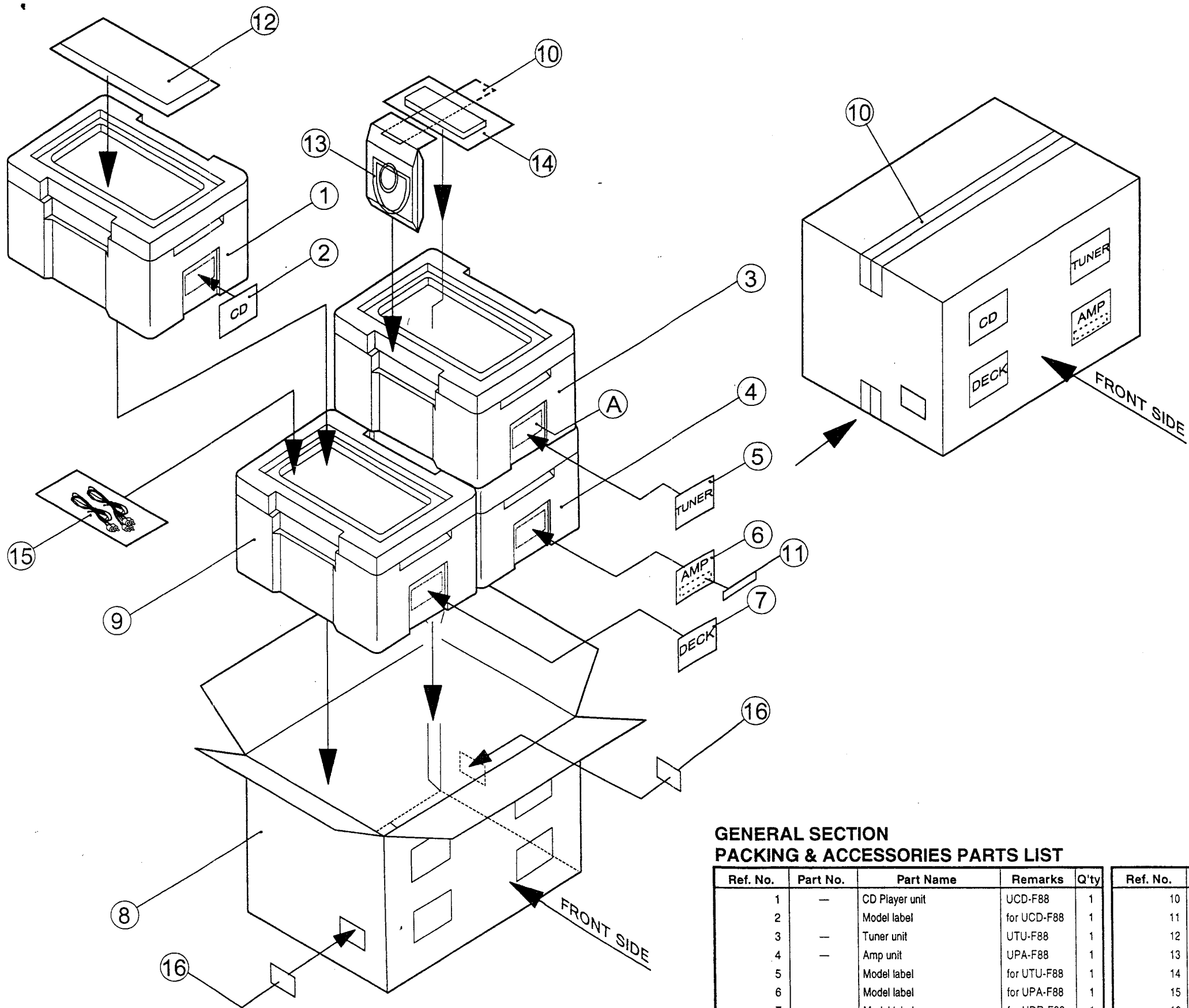
* For improvement purposes, specifications and functions are subject to change without advanced notice.

■ Dolby noise reduction and HX Pro headroom extension manufactured under license from Dolby Laboratories Licensing Corporation.
HX Pro originated by Bang & Olufsen.

■ DOLBY, the double-D symbol and "HX PRO" are trademarks of Dolby Laboratories Licensing Corporation.

GENERAL SECTION

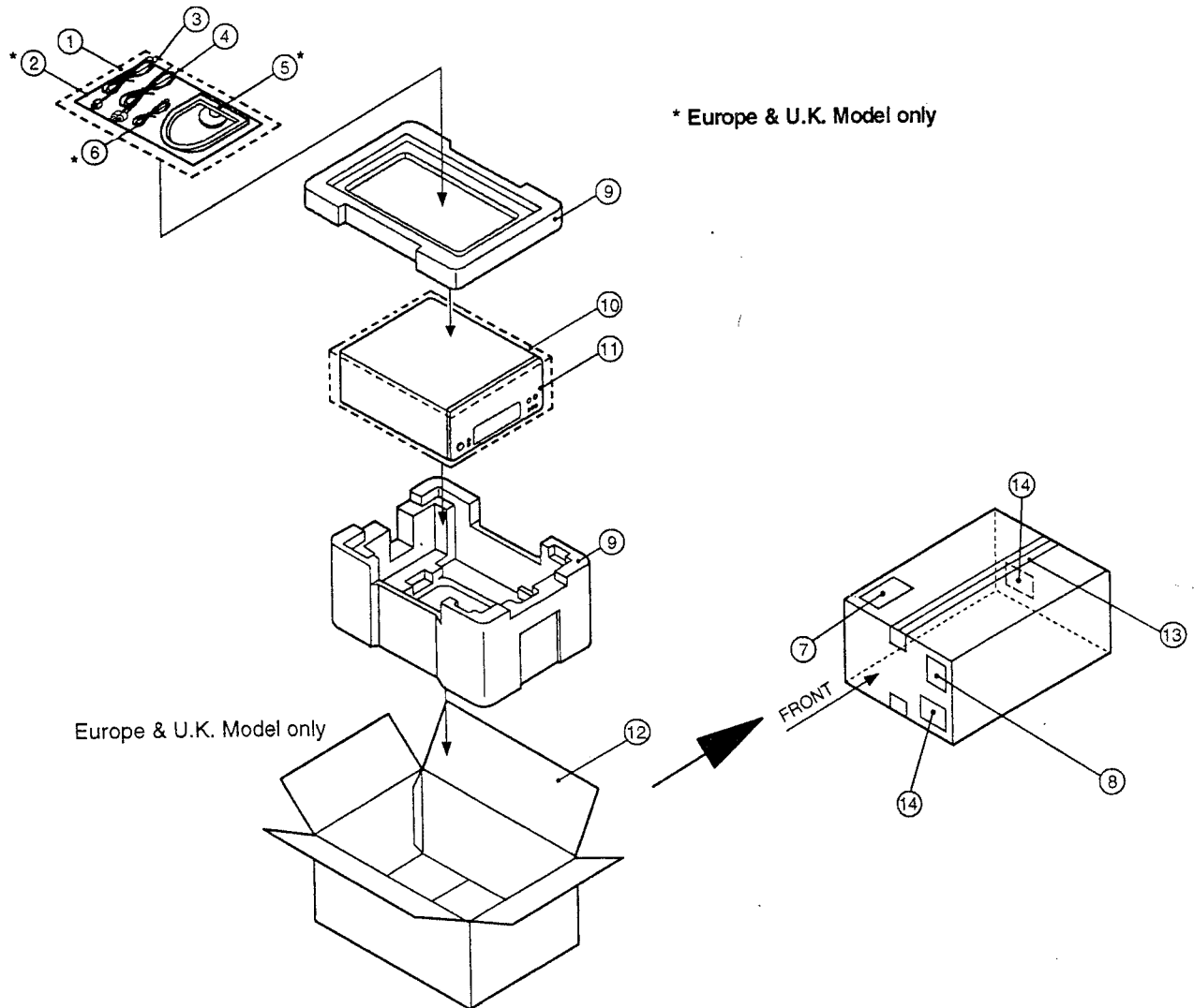
PACKING VIEW
OVER ALL
Asia Model Only



GENERAL SECTION
PACKING & ACCESSORIES PARTS LIST

Ref. No.	Part No.	Part Name	Remarks	Q'ty	Ref. No.	Part No.	Part Name	Remarks	Q'ty
1	—	CD Player unit	UCD-F88	1	10	—	Scotch tape		1
2	—	Model label	for UCD-F88	1	11	—	Serial No.		1
3	—	Tuner unit	UTU-F88	1	12	960 0082 306	Operating instructions		1
4	—	Amp unit	UPA-F88	1	13	—	Accessory ass'y		1
5	—	Model label	for UTU-F88	1	14	960 0081 200	Remocon (RC-829)	Asia model	1
6	—	Model label	for UPA-F88	1	15	—	Cord ass'y		1
7	—	Model label	for UDR-F88	1	16	960 0082 102	Label control		2
8	960 0082 209	Carton case		1					
9	—	Cassette deck unit	UDR-F88	1					

TUNER SECTION (UTU-F88)



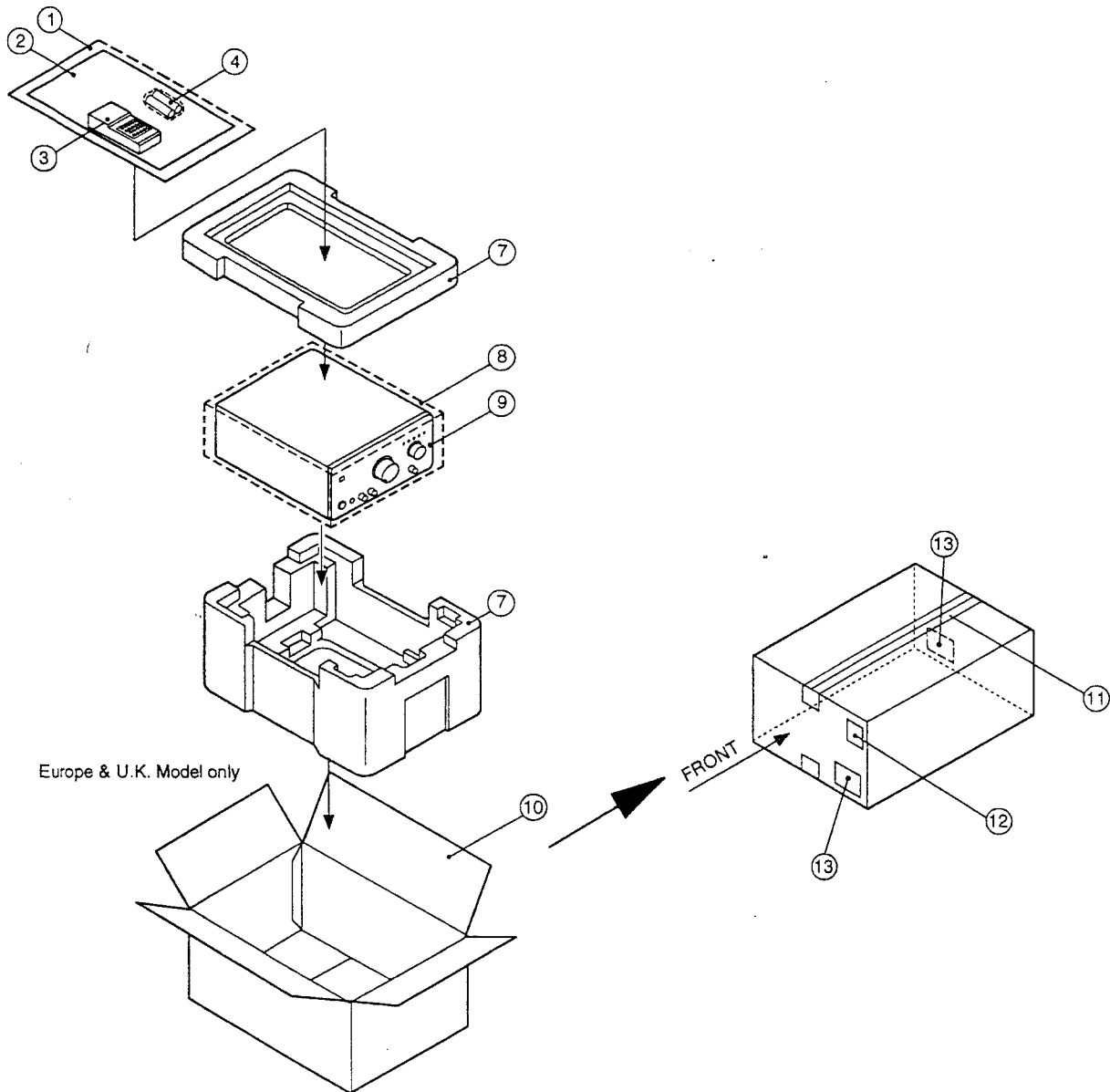
TUNER SECTION (UTU-F88)

PACKING & ACCESSORIES PARTS LIST

Ref. No.	Part No.	Part Name	Remarks	Q'ty	Ref. No.	Part No.	Part Name	Remarks	Q'ty
1	505 0249 010	Poly bag	for accessories	1	9	960 0079 403	Cushion Ass'y		1
2	960 0082 319	Operating instructions		1	10	505 8092 023	Poly bag set		1
3	960 0006 104	RCA cord		1	11	—	Tuner unit	UTU-F88	1
4	960 0031 108	2P pin cord		1	12	—	Carton case		1
5	960 0004 106	AM loop antenna		1	13	—	Scotch tape		1
6	960 0004 203	FM Antenna wire		1	14	—	Label control	Europe & U.K. model	2
7	—	Bar code label	Europe & U.K. model	1					

GENERAL SECTION

PRE-MAIN AMP. SECTION (UPA-F88)

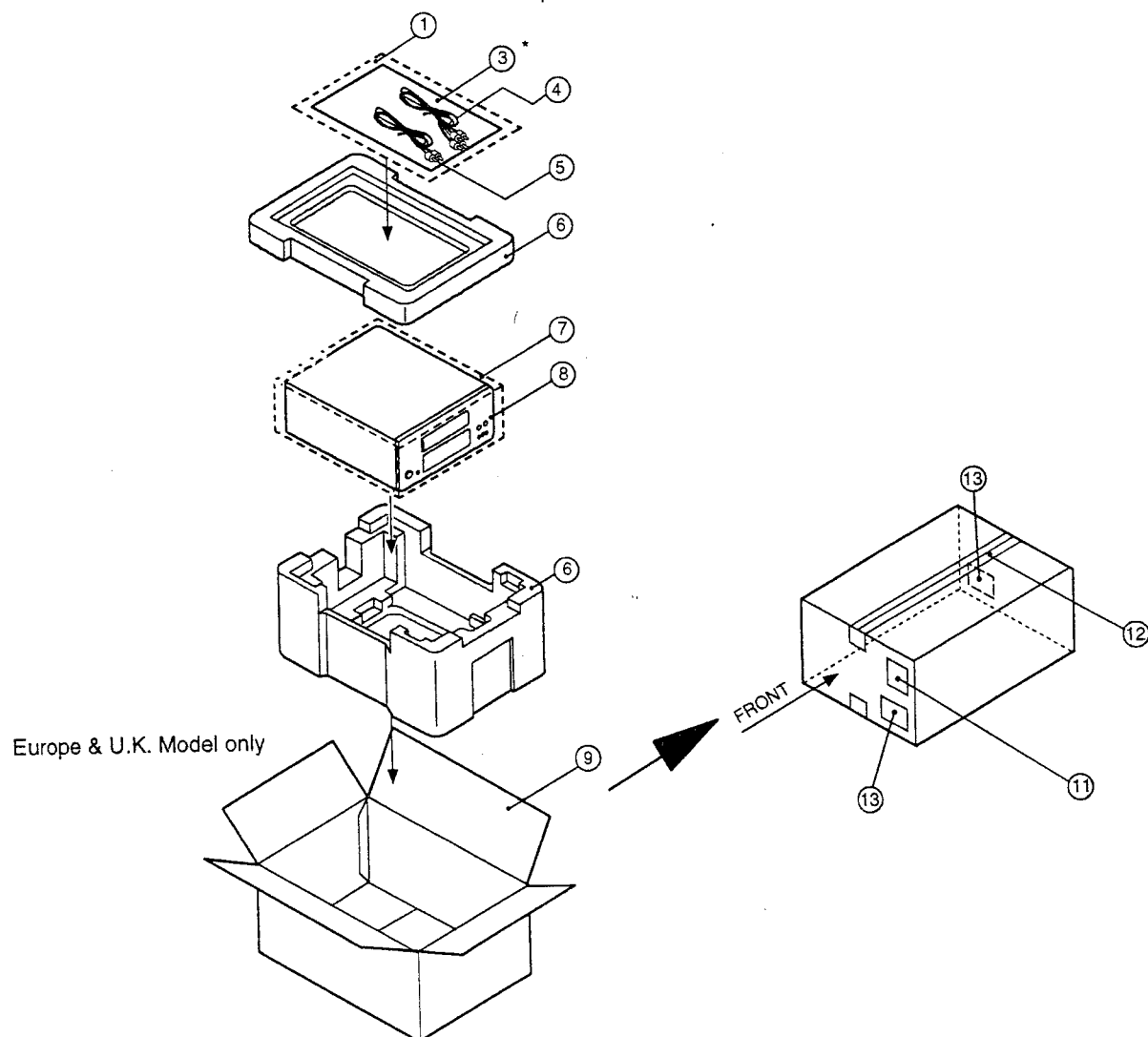


PRE-MAIN SECTION (UPA-F88)
PACKING & ACCESSORIES PARTS LIST

Ref. No.	Part No.	Part Name	Remarks	Q'ty	Ref. No.	Part No.	Part Name	Remarks	Q'ty
1	515 0061 007	Poly bag	for accessories	1	8	505 8092 023	Poly bag set,		1
2	960 0079 322	Operating instructions	Europe model	1	9	—	Amp unit	UPA-F88	1
	960 0079 335	Operating instructions	U.K. model	1	10	—	Carton case		1
3	960 0081 200	Remocon (RC-829)	Asia model	1	11	—	Scotch tape		1
	960 0081 213	Remocon (RC-830)	Europe & U.K.model	1	12	—	Bar code label	Europe & U.K.model	1
4	—	Battery dry		2	13	—	Label control	Europe & U.K. model	2
7	960 0079 403	Cushion Ass'y		1					

CD PLAYER SECTION (UCD-F88)

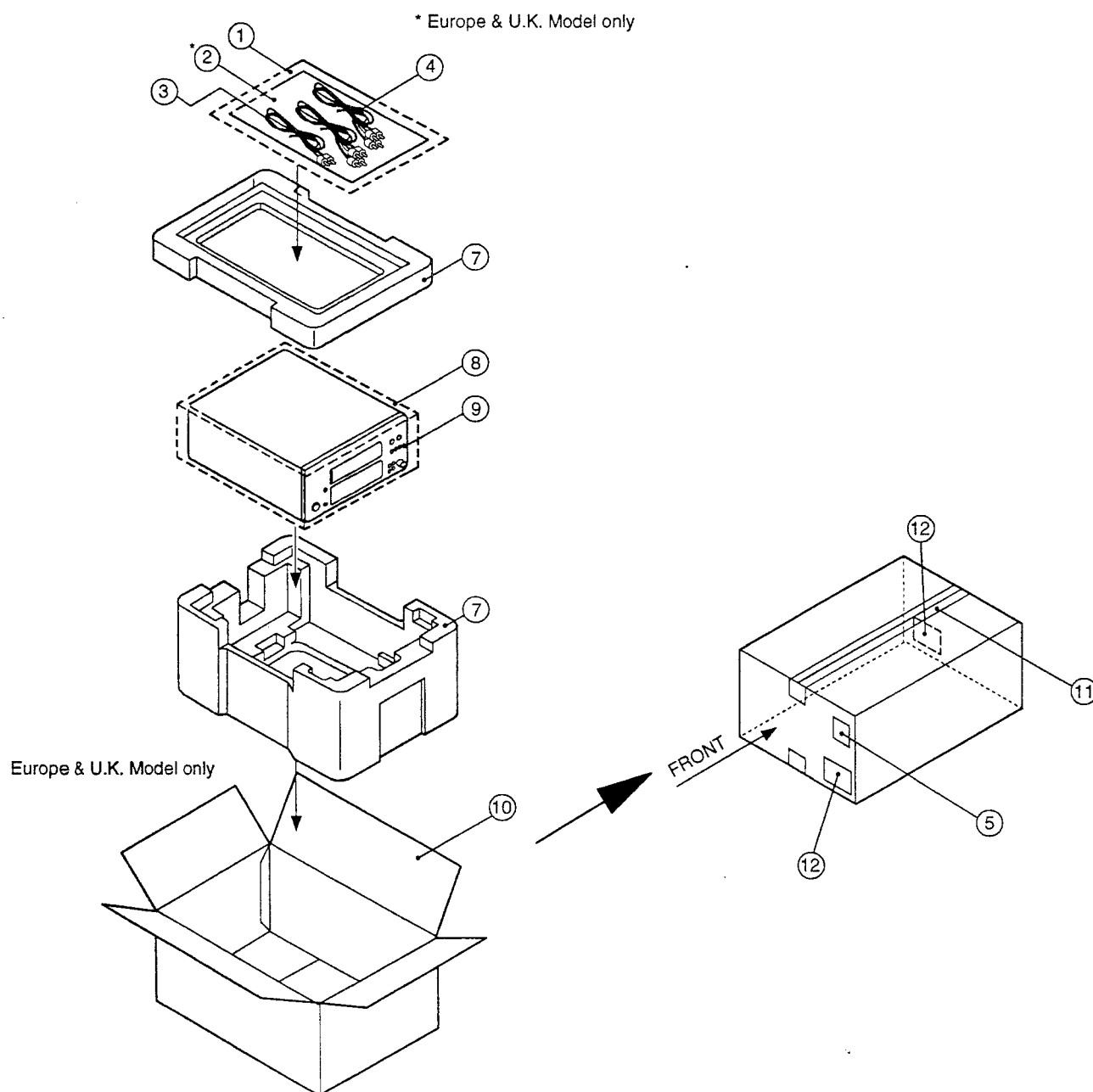
* Europe & U.K. Model only


CD PLAYER SECTION (UCD-F88)
PACKING & ACCESSORIES PARTS LIST

Ref. No.	Part No.	Part Name	Remarks	Q'ty	Ref. No.	Part No.	Part Name	Remarks	Q'ty
1	505 0249 010	Poly bag	for accessories	1	9		Carton case		1
3	960 0083 910	Operating instructions		1	11		Bar code label	Europe & U.K. model	1
4	960 0031 108	2P pin cord		1	12	—	Scotch tape		1
5	960 0006 104	RCA cord		1	13		Label control	Europe & U.K. model	2
6	960 0079 403	Cushion Ass'y		1					
7	505 8092 023	Poly bag set		1					
8	—	CD player unit	UCD-F88	1					

GENERAL SECTION

CASSETTE PLAYER SECTION (UDR-F88)

CASSETTE DECK SECTION (UDR-F88)
PACKING & ACCESSORIES PARTS LIST

Ref. No.	Part No.	Part Name	Remarks	Q'ty
1	505 0249 010	Poly bag	for accessories	1
2	960 0084 919	Operating instructions		1
3	960 0006 104	RCA cord		1
4	960 0031 108	2P pin cord		2
5		Bar code label	Europe & U.K. model	1
7	960 0079 403	Cushion Ass'y		1

Ref. No.	Part No.	Part Name	Remarks	Q'ty
8	505 8092 023	Poly bag set		1
9	—	Cassette deck unit	UDR-F88	1
10	960 0085 015	Carton case		1
11	—	Scotch tape		1
12		Label control	Europe & U.K. model	2

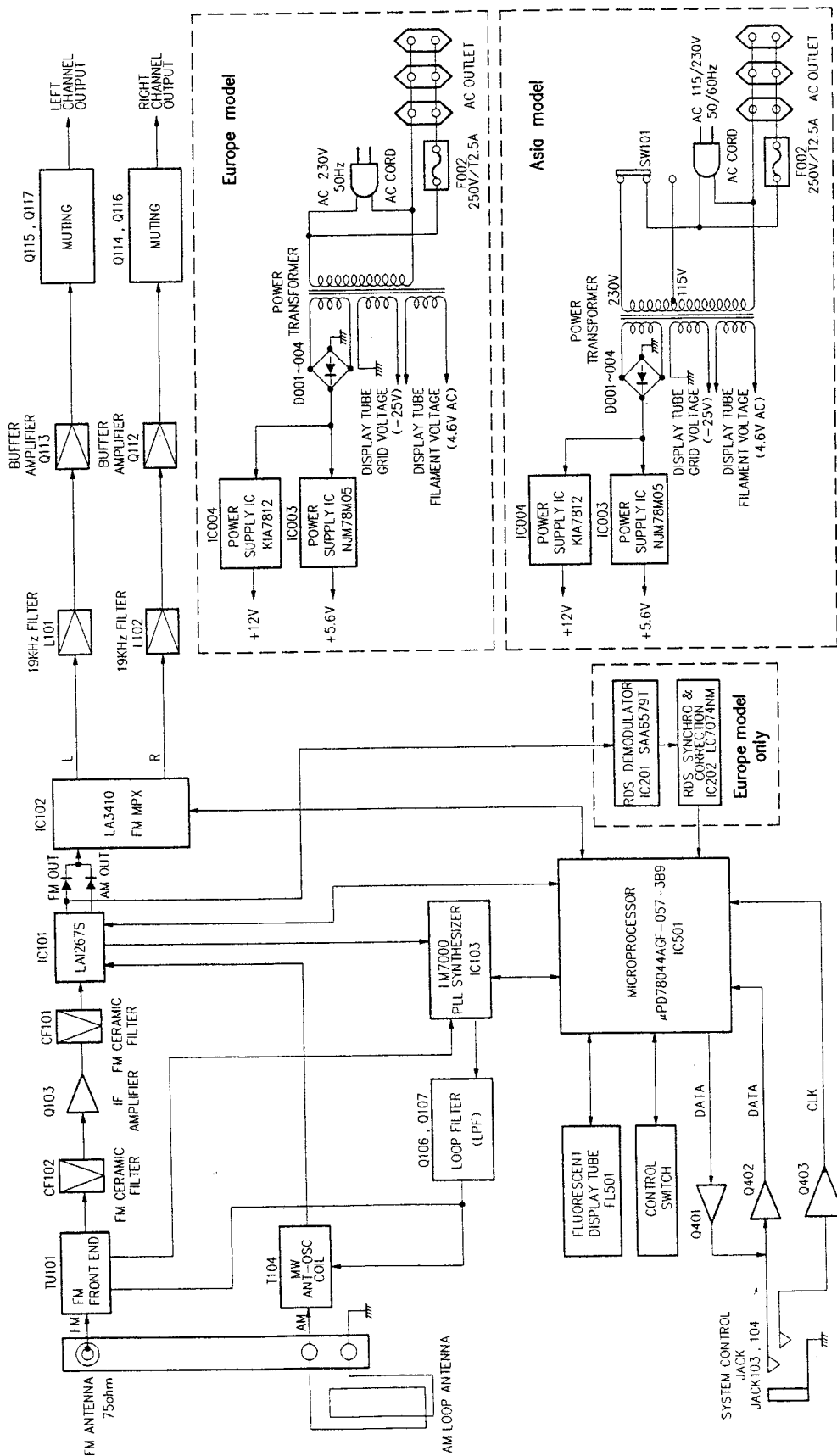
BLOCK DIAGRAM

1

2

3

4



A

B

C

D

E

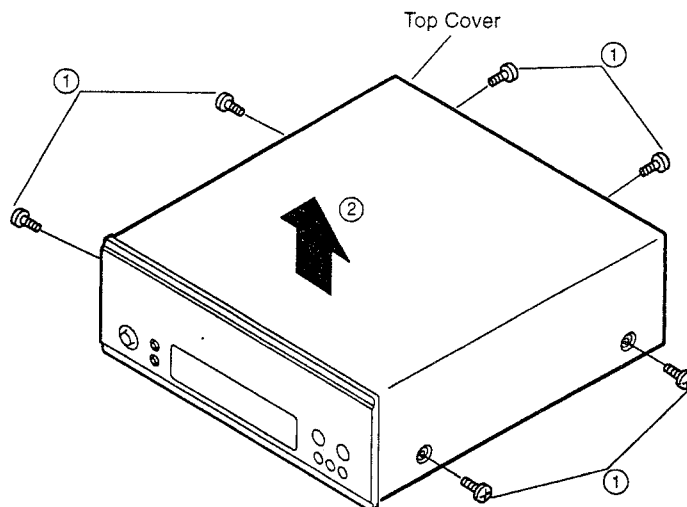
TUNER SECTION

DISASSEMBLY PROCEDURES

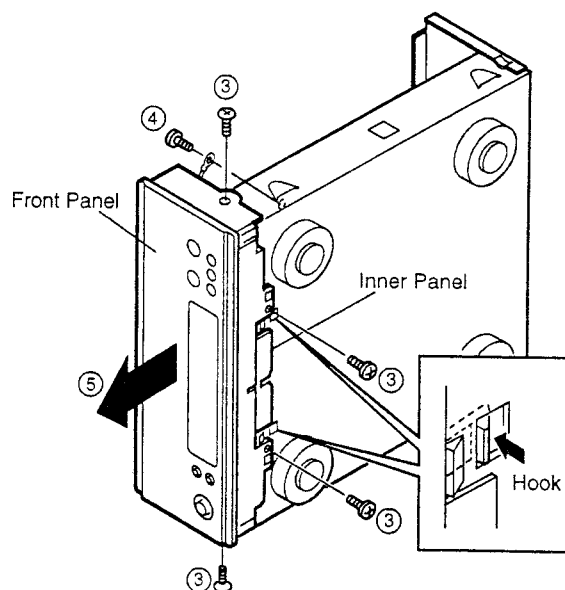
(Assembly is performed in the reverse order.)

1. Top Cover and Front Panel

- ① Remove 6 screws mounting on the Top Cover.
- ② Detach the Top Cover in the arrow direction.

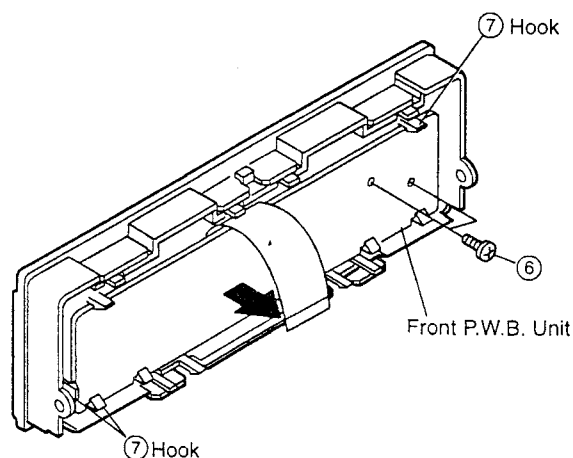


- ③ Remove 2 each screws fastening the Front Panel on the bottom and both sides.
- ④ Remove a screw attached the wire on the chassis.
- ⑤ While releasing 2 hooks of inner panel from the chassis, pull toward arrow direction and detach the Front Panel and the Inner Panel as a whole.



2. Front P.W.B. Unit

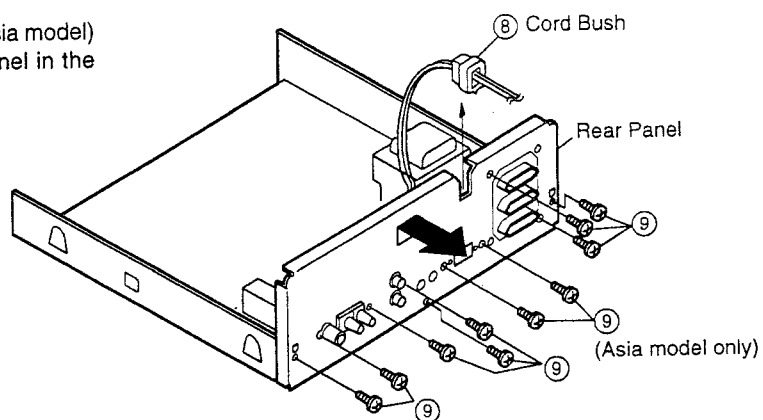
- ⑥ Remove 2 screw fastening the Front P.W.B. Unit.
- ⑦ Release 7 hooks and detach the Front P.W.B. Unit in the arrow direction.



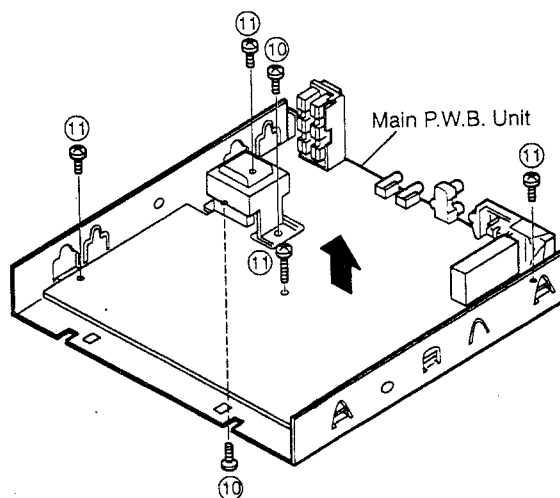
TUNER SECTION

3. Rear Panel and Main P.W.B. Unit

- ⑧ Remove the Cord Bush from the Rear Panel.
- ⑨ Remove 8 screws (Europe model) / 10 screws (Asia model) fixing the Rear Panel, then detach the Rear Panel in the arrow direction.



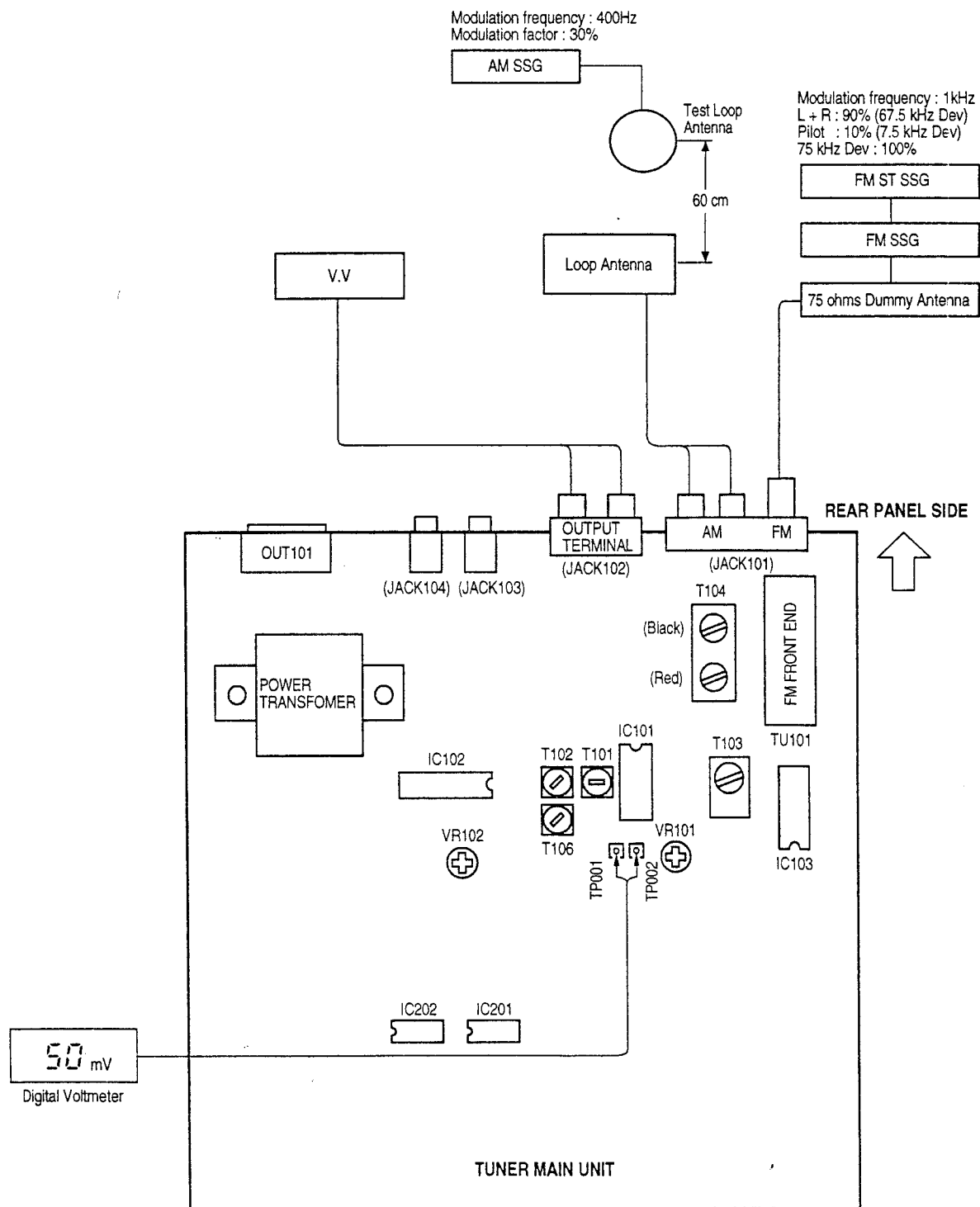
- ⑩ Remove 2 screws mounting on the transformer.
- ⑪ Remove 4 screws fastening the Main P.W.B. Unit, and detach the Main P.W.B. Unit in the arrow direction.



TUNER SECTION

ADJUSTMENTS

WIRING DIAGRAM



TUNER SECTION

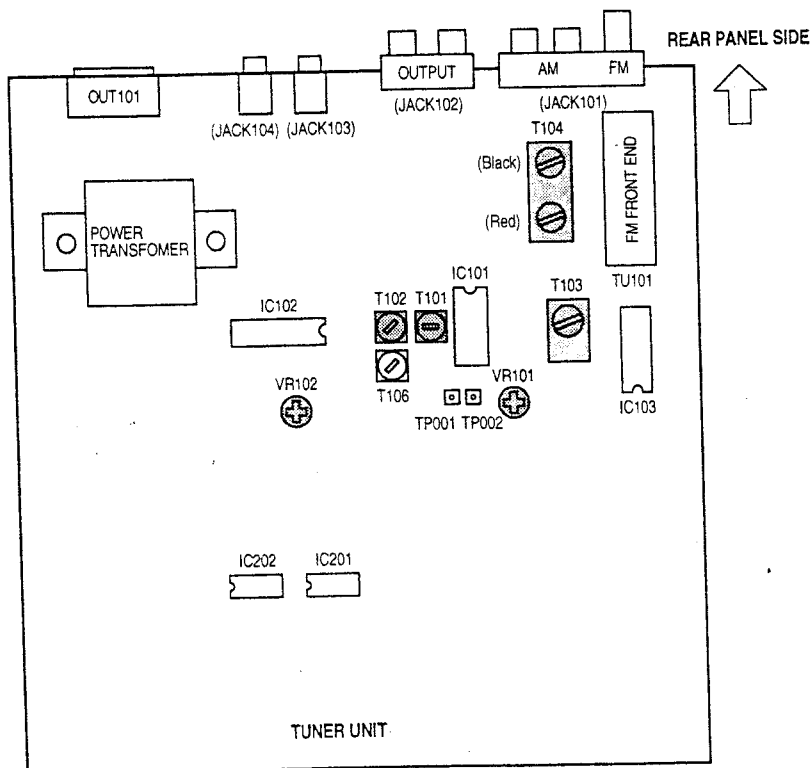
1. FM adjustment (BAND button: FM, FM MODE button: AUTO (STEREO))

Step	Adjustment item	Tuning point (channel setting)	Input				Output		Adjustment location	Setting value	Notes
			Measuring Instrument	Frequency	Input level	Modulation	Connection location	Measuring instrument	Connection location		
1	FM DC balance	98.00MHz	FM S.G.	98.00MHz	60dB μ	1kHz 75kHz DEV	FM antenna terminal	Digital volt meter	⊕ TP001 ⊖ TP002	T101	0 $\pm$ 50mV Perform with monaural modulation signal
2	Distortion	98.00MHz	FM S.G.	98.00MHz	60dB μ	1kHz 75kHz DEV	FM antenna terminal	Distortion factor meter	Output jack	T102	Minimum distortion Perform with monaural modulation signal
3	Repeat Steps 1 and 2										
4	Auto stop level	98.00MHz	FM S.G.	98.00MHz	22dB μ	1kHz 75kHz DEV	FM antenna terminal	Check for the lighting of TUNED	Output jack	VR101	Input level 22dB μ $\pm$ 4dB (Level at which TUNED lights up) Level at which the output is provided
5	Stereo separation	98.00MHz	FM stereo modulator FM S.G.	98.00MHz	60dB μ	1kHz L or R : 67.5kHz DEV Pilot ; 7.5kHz DEV	FM antenna terminal	VTVM Oscilloscope	Output jack	VR102	Minimum R.ch. Output Perform with L.ch. Input of FM stereo modulator

2. AM adjustment (BAND button: AM)

Step	Adjustment item	Tuning point (channel setting)	Input				Output		Adjustment location	Setting value	Notes
			Measuring Instrument	Frequency	Input level	Modulation	Connection location	Measuring instrument	Connection location		
1	IF	Clear frequency (without a broadcast)	AM IF sweep	—	Level at which AGC is not applied	—	AM antenna terminal	Oscilloscope	Output jack	T103	Waveform maximum and symmetry
2	Band edge	522kHz	—	—	—	—	—	Digital voltmeter	⊕ R124 (10kohm) ⊖ G	T104 Black	1.2V $\pm$ 0.2v
		1611kHz								—	Approx. 7.6v No place to adjust
3	Tracking	603kHz	AM S.G.	603kHz	Level at which AGC is not applied	400Hz 30%	Loop antenna	VTVM	Output terminal	T104 Red	Maximum output
4	Repeat Steps 2 and 3, and set the output to maximum.										

TUNER MAIN UNIT (Component Side)

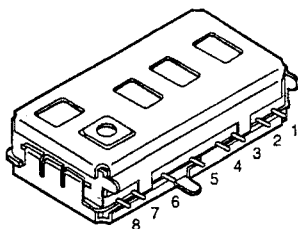


TUNER SECTION

Front End (TU101)

Part No.: 960 0037 319

Europe model

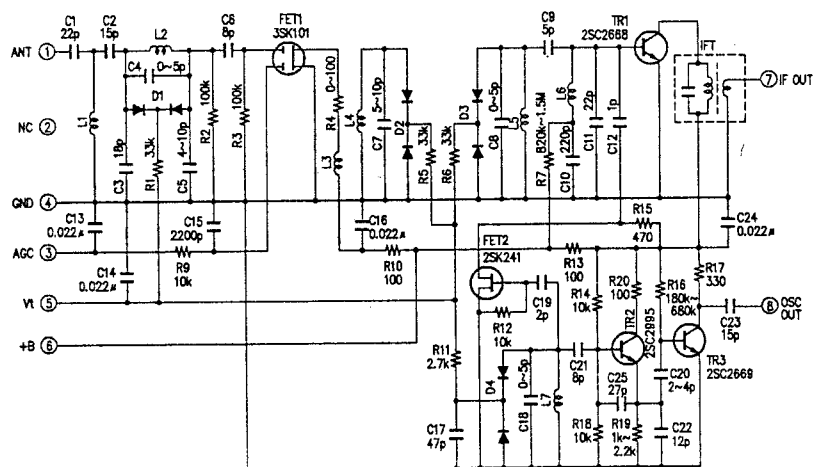


EXTERNAL TERMINALS

1. ANT
2. NC
3. AGC
4. GND
5. Vt
6. +B
7. IF OUT
8. OSC OUT

NOTES

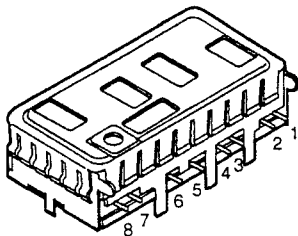
- 1) TERMINAL NUMBER REFER TO OVERALL APPEARANCE
- 2) RECEIVING FREQUENCY 87.5 ~ 108 MHz
- 3) INPUT IMPEDANCE 75 ohms
- 4) OUTPUT IMPEDANCE 300 ohms
- 5) SUPPLY VOLTAGE +B 12 V
- 6) TUNING VOLTAGE Vt 1.6 ~ 8.0 V
- 7) AGC VOLTAGE 5V



Front End (TU101)

Part No.: 960 0037 306

Asia model

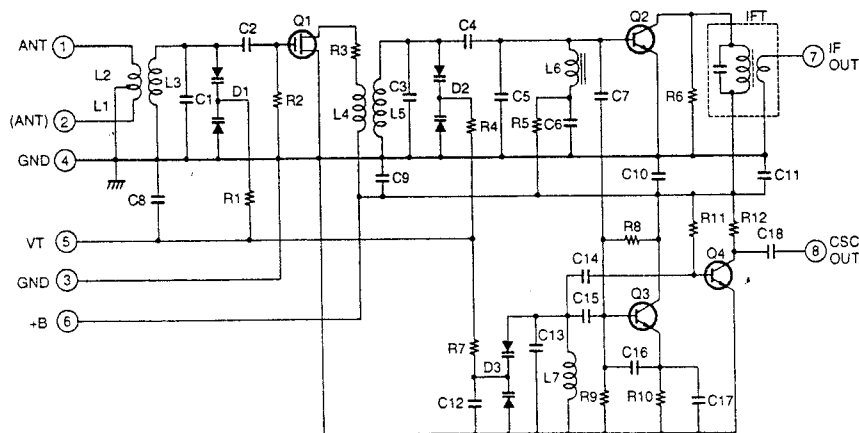


EXTERNAL TERMINALS

1. ANT
2. OPEN
3. GND
4. GND
5. Vt
6. +B
7. IF OUT
8. OSC OUT

NOTES

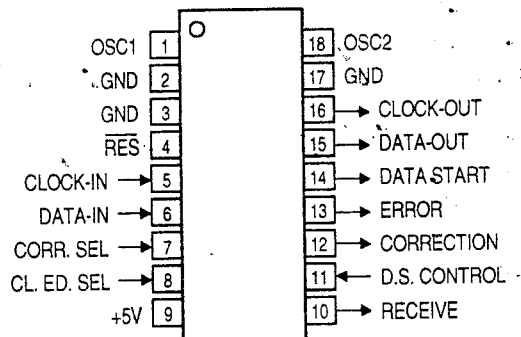
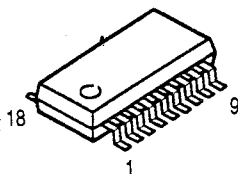
- 1) TERMINAL NUMBER REFER TO OVERALL APPEARANCE
- 2) RECEIVING FREQUENCY 87.5 ~ 108 MHz
- 3) INPUT IMPEDANCE ① - ②: 300 ohms, ① - ④: 75 ohms



SEMICONDUCTORS

● IC's

LC7074NM (IC202)...Europe model only

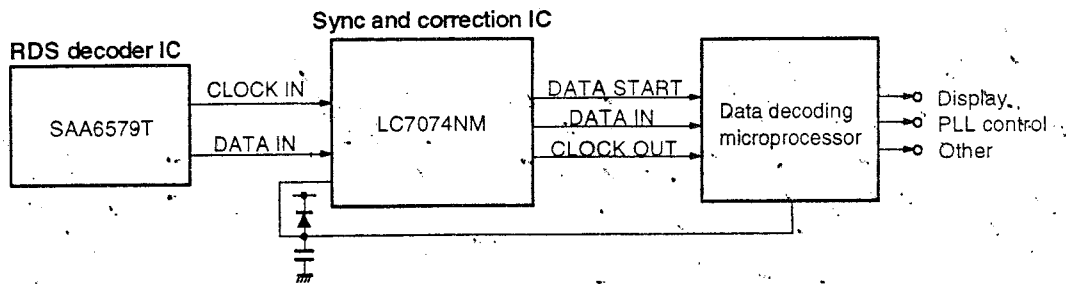


LC7074NM-TE-R Terminal Function

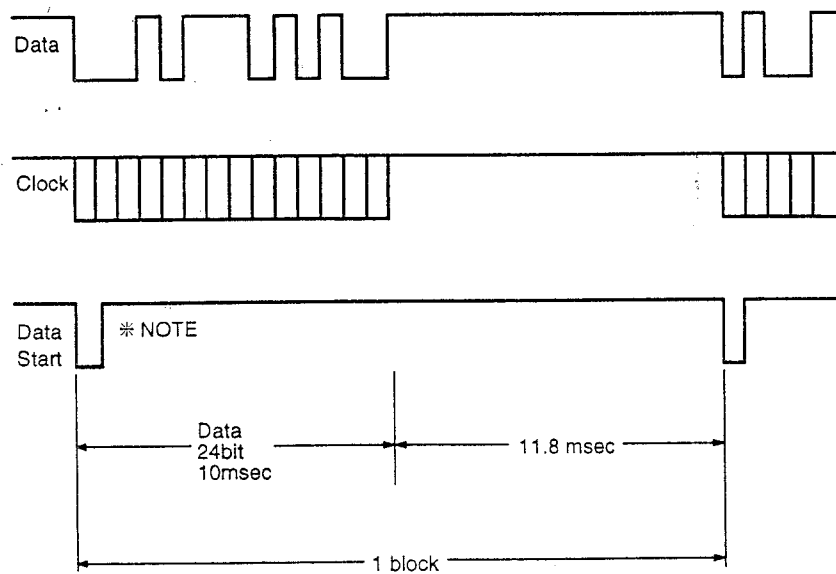
Pin No.	Symbol	I/O	INI	Function
1	OSC1	I	-	• 4 MHz ceramic oscillator connection.
2	GND	-	-	• Ground
3	GND	-	-	• Ground
4	RES	I	-	• System reset input. • Reset and restart is accomplished by inputting the low level for 4 or more cycles.
5	CLOCK IN	I	H	• RDS LA2230 series demodulation clock input.
6	DATA IN	I	H	• RDS LA2230 serial demodulation data input.
7	CORR. SEL	I	H	• Error correction on/off selection input. • Sets the IC to correct errors in the RDS demodulation data or to output the data without correction. When input is 0 : No corrections are made When input is 1 : Corrections are executed
8	CL. ED. SEL	I	H	• Serial data clock polarity selection input. When input is 0 : Serial data output is enabled at the rise of output clock. (Serial data output changes at the fall of the output clock.) When input is 1 : Serial data output is enabled at the fall of the output clock. (Serial data output changes at the rise of the output clock.) Note: Set at the time of RES input.
9	+5V	-	H	• Power supply
10	RECEIVE (NC)	O	H	• Output during RDS data reception. • After the completion of sync detection, there is a low-level output while the serial data is being output. There is a high-level output at other times. • Open drain output.
11	D.S. CONTROL	I	H	• Block data start signal control input. When input is 0 : Data start signal is output for all blocks. When input is 1 : Data start signal is output for only the second block.
12	CORRECTION (NC)	O	H	• Output without error correction. • There is a low level output when the output data of the serial data output have been corrected when correction is not possible. There is a high-level output when correction have not been applied. • Open drain output.
13	ERROR (NC)	O	H	• Presence error output. • There is a low-level output when the output data of the serial data output has an error and correction is not possible. There is a high-level output when there is no error or when the error has been corrected. • Open drain output.
14	DATA START	O	H	• Block data start signal of the serial data output. Output with pull-up resistor.
15	DATA OUT	O	H	• Data output of the serial data output. Output with pull-up resistor.
16	CLOCK OUT	O	H	• Clock output of the serial data output. Output with pull-up resistor.
17	GND	-	-	• Ground
18	OSC2	O	-	• 4 MHz ceramic oscillator connection.

TUNER SECTION

Structure of the RDS Data Processing System



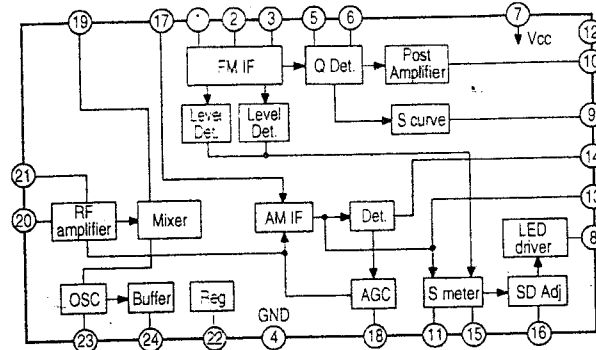
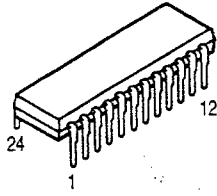
Serial Data Output Timing Chart



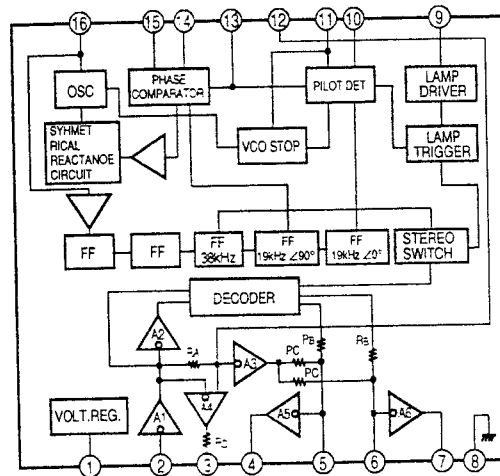
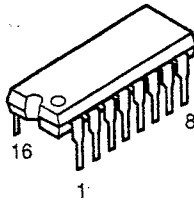
NOTE: Using the D.S. CONTROL input, only the second block among the entire 4 blocks of RDS data can be switched between the data start output and the total blocks' data start output.

TUNER SECTION

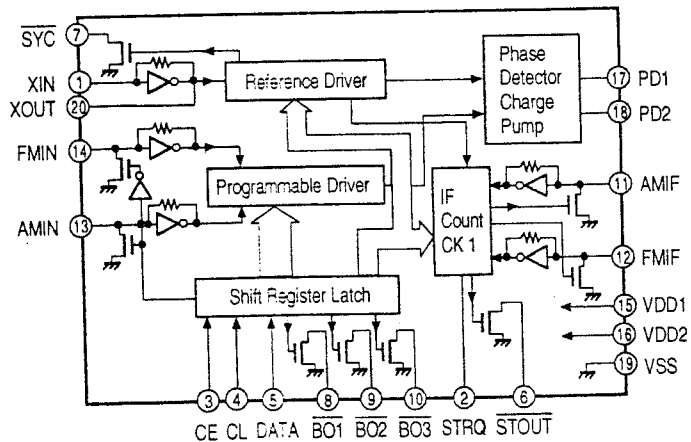
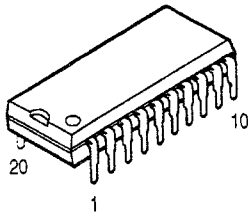
LA1267S (IC101)



LA3410 (IC102)

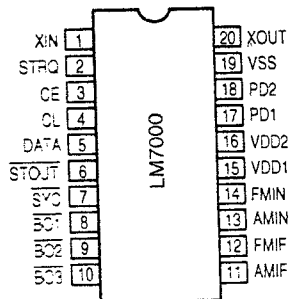


LM7000 (IC103)



Pin Description

- SYNC : Clock (400kHz) for the controller
 XIN, XOUT : X'tal oscillator (7.2MHz) with built-in feedback resistor
 FM IN, AM IN : Local oscillator signal input
 CE, CL, DATA : Data input
 B01, B02, B03 : Band data output, B01 can be set as the time base output (8Hz)
 STRQ : IF counter request input
 STOUT : Auto research stop signal output
 VDD1, VDD2, Vss : Power supply (VDD2 is back-up power supply)
 AMIF, FMIF : IF signal input
 PD1, PD2 : Charge pump output

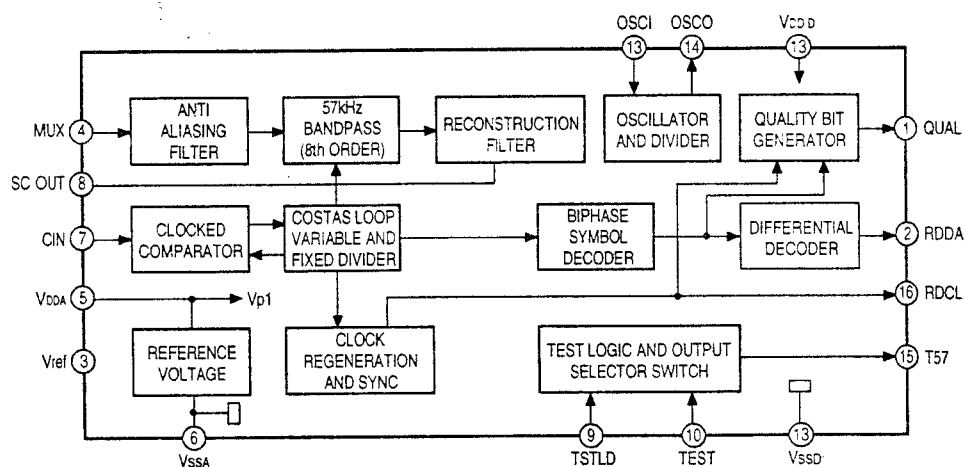
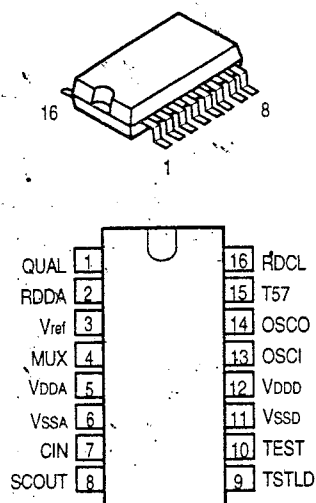


TUNER SECTION

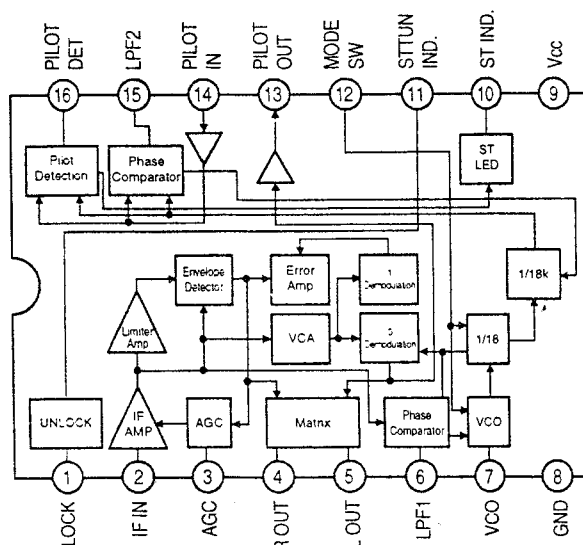
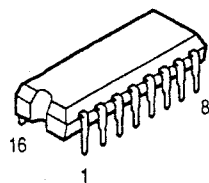
SAA6579T (IC201) ... Europe model only

SAA6579T Terminal Function

Pin No.	Symbol	Description
1	QUAL	Quality indication output.
2	RDDA	RDS data output.
3	Vref	Reference voltage output (0.5 VDDA).
4	MUX	Multiplex signal input.
5	VDDA	+5V supply voltage for analog part.
6	VSSA	Ground for analog part (0V).
7	CIN	Subcarrier input to comparator.
8	SCOUT	Subcarrier output of reconstruction filter.
9	TSTLD	Test control.
10	TEST	Test enable input.
11	VSSD	Ground for digital part (0V).
12	VDDD	+5V supply voltage for digital part.
13	OSCI	Oscillator input.
14	OSCO	Oscillator output.
15	T57	57kHz clock signal output.
16	RDCL	RDS clock output.



TA2040AP (IC301)



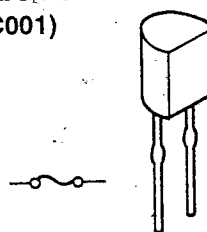
TUNER SECTION

NJM7805FA
(IC003)
KIA7812FA
(IC004)

1: Output
2: GND
3: Input



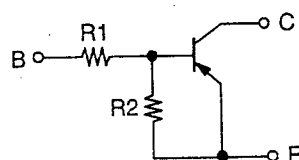
● IC PROTECTOR
ICP-N15 (IC001)



● TRANSISTORS

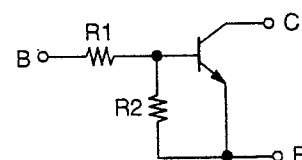
DTA114ES (PNP)
DTC144ES (NPN)
DTC343TS (NPN)

PNP Type
DTA ES Series



	R1	R2
DTA114ES	10 kohm	10 kohm

NPN Type
DTC ES/TS Series



	R1	R2
DTC144ES	47 kohm	47 kohm
DTC343TS	4.7 kohm	—



B (Base)
C (Collector)
E (Emitter)

2SA933S (S)
2SC1740S (R)



B (Base)
C (Collector)
E (Emitter)

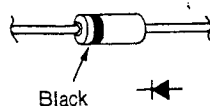
KSA916 (Y)
KSC1845 (F)
KTC3194 (O)



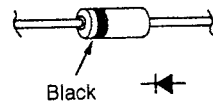
B (Base)
C (Collector)
E (Emitter)

● DIODES

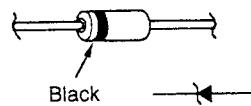
1N4002A



1SS131

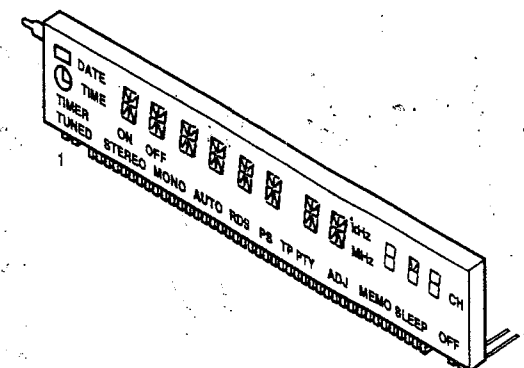


MTZJ6.2B
MTZJ8.2B
MTZJ27B



● FLUORESCENT DISPLAY TUBE 11 BT127GK (FL501)

(Part No. : 960 0007 103)



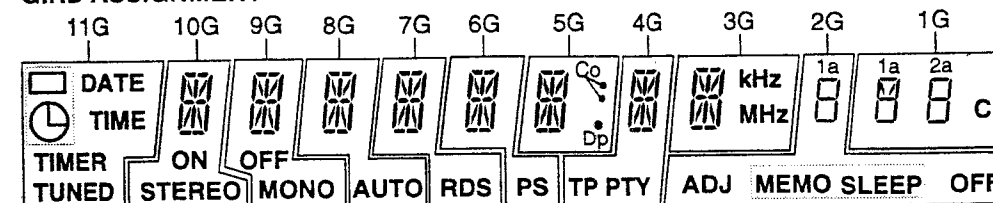
PIN CONNECTION

PIN CONNECTION																								
Pin No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Connection	F1	F1	NP	NP	1G	2G	3G	4G	5G	6G	7G	8G	9G	10G	11G	NC	NC	NC	NC	NC	NC	NC	NC	NC

Pin No.	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47
Connection	NC	NC	NC	P16	P15	P14	P13	P12	P11	P10	P9	P8	P7	P6	P5	P4	P3	P2	P1	NP	NP	F2	F2

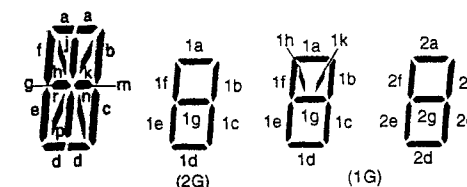
NOTE 1) F1 and F2: Filaments
2) NP: No pin
3) NC: No connection
4) 1G through 11G: Gird

GIRD ASSIGNMENT



ILLUMINATION COLORS

Reddish orange portion of above pattern
(Rsh. O x = 0.645, y = 0.355)
Green (G. x = 0.235, y = 0.405) Other portions



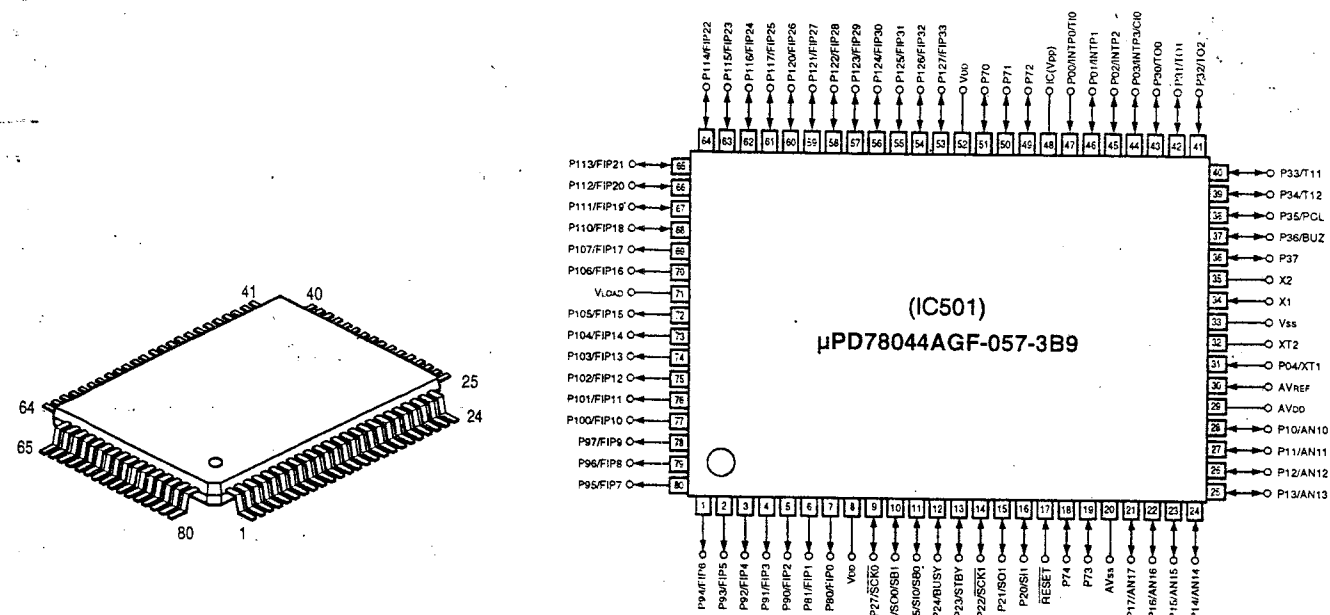
ANODE CONNECTION

	11G	10G	9G	8G	7G	6G	5G	4G	3G	2G	1G
P1		a	a	a	a	a	a	a	a	1a	1a
P2	DATE	b	b	b	b	b	b	b	b	1b	1b
P3	TIME	c	c	c	c	c	c	c	c	1c	1c
P4	TIMER	d	d	d	d	d	d	d	d	1d	1d
P5	TUNED	e	e	e	e	e	e	e	e	1e	1e
P6	TUNED	f	f	f	f	f	f	f	f	1f	1f
P7	—	g	g	g	g	g	g	g	g	1g	1g
P8	—	h	h	h	h	h	h	h	h	ADJ	1h, 1k
P9	—	j	j	j	j	j	j	j	j	MEMO	2a
P10	—	k	k	k	k	k	k	k	k	SLEEP	2b
P11	—	m	m	m	m	m	m	m	m	OFF	2c
P12	—	n	n	n	n	n	n	n	n	—	2d
P13	—	p	p	p	p	p	p	p	p	—	2e
P14	—	r	r	r	r	r	r	r	r	—	2f
P15	—	ON	OFF	AUTO	RDS	PS	col	TP	kHz	—	2g
P16	—	STEREO	MONO	—	—	—	Dp	PTY	MHz	—	CH

TUNER SECTION

MICROPROCESSOR DOCUMENTATION

μPD78044AGF-057-3B9 : Part No. 960 0007 006 (IC105)



1. Overview

The functions of this microprocessor comprise the following three types.

a. Tuner functions

- Control operations required for receiving FM and AM broadcasts.

b. Timer functions

- These functions count the clock of the 24-hour display.
- These functions perform two types of timer operations, "everyday and sleep."

c. Display functions

- These functions output the drive signals of the fluorescent display tube.

NOTE1 Plugging the power cord into a power outlet while depressing both the STANDBY and MEMORY buttons will automatically register the frequencies used for tracking adjustments to the preset memory. These frequencies can be used for adjustments and other purposes.

	P1	P2	P3	P4	P5	P6	P7	P8	—	—
AM (kHz)	522	603	846	999	1098	1404	1512	1611		
	P11	P12	P13	P14	P15	—	—	—	—	—
FM (MHz)	87.50	89.00	98.00	100.10	108.00					

※ P9, P19 through P30 are AM 522 kHz, and P10, P16 through P18 are FM 87.50 MHz.

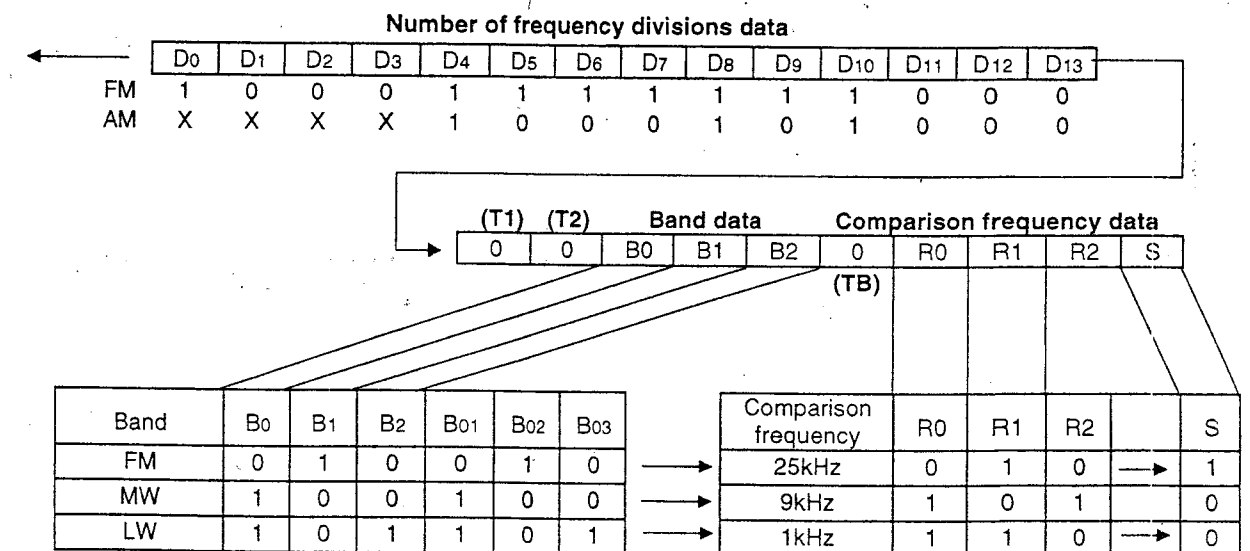
NOTE2 Plugging the power cord into a power outlet while depressing both the MEMORY and BAND buttons will initialize all settings including the current time and the contents of the timers and preset memory.

2. Receiving Band Table

Band	Receiving frequency	Local oscillator frequency	IF	Frequency division ratio	Comparison frequency	Step frequency	Other
FM	87.50 ~ 108.00MHz	98.20 ~ 118.70MHz	10.7MHz	1	25kHz	50kHz	
AM	522 ~ 1611kHz	972 ~ 2061kHz	450kHz	—	9kHz	9kHz	

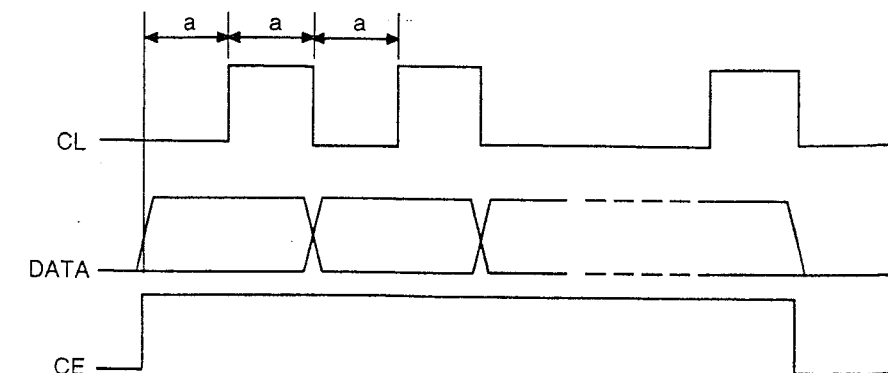
3. Signals sent to the LM7000 Programmable Divider

- Signals to the programmable divider are sent from 3 sources: CE OUT, CLOCK OUT, and DATA OUT.
- The programmable divider takes in DATA at CLOCK $\downarrow$, when CE equals 1.
- The data is a 24-bit serial signal which is taken in to the programmable divider from the LSB.
(At the AM setting, D₀ through D₃ are ignored, so that D₄ becomes the LSB.)
- The data is made up of the number of frequency divisions data, the band data, and the comparison frequency data.
(See diagram below.)



e. Timing for sending

a = 2.5 μsec



TUNER SECTION

 μ PD78044GF-057-3B9 : 262 1973 204 (IC501) Terminal Function

Pin	Port Name	Function Name	I/O	Ini	Act	Function
1	P94/RIP6	7G	O	L	H	Fluorescent tube digit signal output.
2	P93/FIP5	6G	O	L	H	Fluorescent tube digit signal output.
3	P92/FIP4	5G	O	L	H	Fluorescent tube digit signal output.
4	P91/FIP3	4G	O	L	H	Fluorescent tube digit signal output.
5	P90/FIP2	3G	O	L	H	Fluorescent tube digit signal output.
6	P81/FIP1	2G	O	L	H	Fluorescent tube digit signal output.
7	P80/FIP0	1G	O	L	H	Fluorescent tube digit signal output.
8	Vdd	5V	—	—	—	+5V.
9	P27/SCK0	SBCLK	O	L	H	DENON BUS clock.
10	P26/SO0/SB1	TXD0	O	L	H	DENON BUS data output.
11	P25/F10/SB0	RXD	I	L	H	DENON BUS data input.
12	P24/BUSY	RDS Reset	O	L	L	LC7070 reset output.
13	P23/STBY	PLLCE	O	H	H	PLL serial data selection output.
14	P22/SCK1	C Clock	I/O	H	—	RDS data fetch clock input and PLL control clock output.
15	P21/SO1	PLL Data	O	H	—	PLL serial data output.
16	P20/SI1	RDS Data	I	H	—	RDS serial data input.
17	RESET	RESET	I	H	H	Reset.
18	P74	PLLSTRQ	O	L	L	IF count operation request output.
19	P73	Signal In	I	H	L	RF signal detection signal input.
20	AVss	GND	—	—	—	A/D converter ground.
21	P17/ANI7	Tuned In	I	H	—	FM/AM sync signal input.
22	P16/ANI6	NC	I	H	—	VDD connection.
23	P15/ANI5	NC	I	H	—	VDD connection.
24	P14/ANI4	NC	I	H	—	VDD connection.
25	P13/ANI3	NC	I	H	—	VDD connection.
26	P12/ANI2	NC	I	H	—	VDD connection.
27	P11/ANI1	ANI1	I	—	—	Key input *1.
28	P10/ANI0	ANI0	I	—	—	Key input *2.
29	AVdd	AVdd	—	—	—	Analog 5V (Common power supply with Vdd as a measure against leakage).
30	AVREF	AVREF	—	—	—	+5V (A/D converter reference voltage).
31	P04/XT1	XT1	I	—	—	32.7 kHz (Xtal input oscillator for the clock).
32	XT2	XT2	O	—	—	32.7 kHz (Xtal output oscillator for the clock).
33	Vss	Vss	—	—	—	Digital ground.
34	X1	OSCI	I	—	—	4.19 Mhz (Xtal input).
35	X2	OSCO	O	—	—	4.19 Mhz (Xtal output).
36	P37	Power On	O	H	H	Power on/off switching.
37	P36/BUZ	NC	O	L	L	Open.
38	P35/PCL	XTP	O	—	—	Xtal oscillator output (for frequency adjustments).
39	P34/T12	NC	O	L	L	Open.
40	P33/T11	50/60	I	—	—	AC power supply frequency (50/60 Hz) detection.
41	P32/TO2	Local/DX	O	L	—	RF signal strength control signal output.
42	P31/TO1	AUTO/MONO	O	L	—	Stereo (Auto)/Mono switching.
43	P30/TO0	NC	O	L	L	Open.
44	P03/INTP3/CIO	RDS Start	I	H	L	RDS signal start detection.
45	P02/INTP2	NC	O	L	L	Open.

*1: Each of the following buttons POWER, CLOCK/DISPLAY, TIMER, BAND, MONO/STEREO, and TUNING up/down.

*2: Each of the following buttons PRESET up/down, PANEL, CT, PTY, RDS, MEMO, and DIMMER.

Pin	Port Name	Function Name	I/O	Ini	Act	Function
46	P01/INTP1	RXD	I	H	H	DENON BUS data signal input (Transfer start request detection).
47	P00/INTP0/T10	REMOCON	I	—	—	Remote control received data input.
48	IC (Vpp)	Vpp	—	—	—	Ground (Set to 5V when PROM program is used).
49	P72	AM Stereo	I	H	L	AM stereo signal detection.
50	P71	Stop In	I	H	L	IF count sync detection.
51	P70	Stereo In	I	H	L	FM stereo recovery detection.
52	Vdd	VDD	—	—	—	5V.
53	P127/FIP33	Mute Out	O	L	L	Mute output.
54	P126/FIP32	NC	O	L	L	Open.
55	P125/FIP31	NC	O	L	L	Open.
56	P124/FIP30	NC	O	L	L	Open.
57	P123/FIP29	NC	O	L	L	Open.
58	P122/FIP28	Diode In	I	—	L	AM STEREO, EX, RDS, and ADJUST functions selection switch (diode) state detection.
59	P121/FIP27	Jumper	I	—	H	Destination [Switch (diode) and frequency] state detection.
60	P120/FIP26	Seg16	O	L	L	Segment 16 output.
61	P117/FIP25	Seg15	O	L	L	Segment 15 output.
62	P116/FIP24	Seg14	O	L	L	Segment 14 output.
63	P115/FIP23	Seg13	O	L	L	Segment 13 output.
64	P114/FIP22	Seg12	O	L	L	Segment 12 output.
65	P113/FIP21	Seg11	O	L	L	Segment 11 output.
66	P112/FIP20	Seg10	O	L	L	Segment 10 output.
67	P111/FIP19	Seg9	O	L	L	Segment 9 output.
68	P110/FIP18	Seg8	O	L	L	Segment 8 output.
69	P107/FIP17	Seg7	O	L	L	Segment 7 output.1
70	P106/FIP16	Seg6	O	L	L	Segment 6 output.
71	VLOAD	VLOAD	—	—	—	— High B.
72	P105/FIP15	Seg5	O	L	L	Fluorescent tube digit signal output.
73	P104/FIP14	Seg4	O	L	L	Fluorescent tube digit signal output.
74	P103/FIP13	Seg3	O	L	L	Fluorescent tube digit signal output.
75	P102/FIP12	Seg2	O	L	L	Fluorescent tube digit signal output.
76	P101/FIP11	Seg1	O	L	L	Fluorescent tube digit signal output.
77	P100/FIP10	11G	O	L	L	Fluorescent tube digit signal output.
78	P97/FIP9	10G	O	L	L	Fluorescent tube digit signal output.
79	P96/FIP8	9G	O	L	L	Fluorescent tube digit signal output.
80	P95/FIP7	8G	O	L	L	Fluorescent tube digit signal output.

TUNER SECTION

PRINTED WIRING BOARD

1

2

3

4

5

6

7

8

TUNER UNIT ASS'Y

Component Side

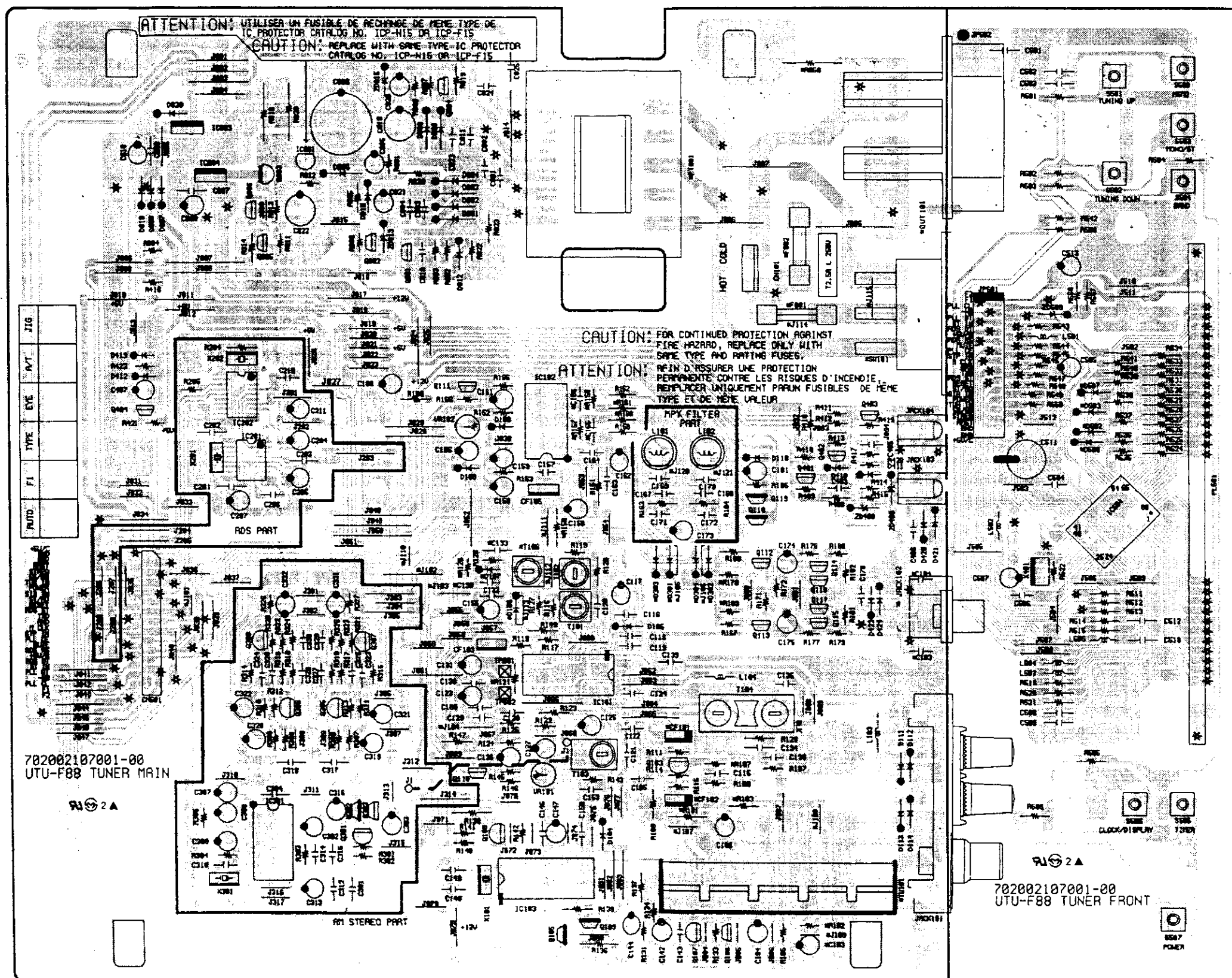
A

B

C

D

E





TUNER SECTION

NOTE FOR PARTS LIST

- Part indicated with the mark "O" are not always in stock and possibly to take a long period of time for supplying, or in some case supplying of part may be refused.
 - When ordering of part, clearly indicate "1" and "I" (i) to avoid mis-supplying.
 - Ordering part without stating its part number can not be supplied.
 - Part indicated with the mark "★" is not illustrated in the exploded view.
 - Not including Carbon Film ±5%, 1/4W Type in the P.W.Board parts list. (Refer to the Schematic Diagram for those parts.)
- WARNING:**
Parts marked with this symbol  have critical characteristics.
Use ONLY replacement parts recommended by the manufacturer.

Resistors

Ex.: **RN 14K 2E 182 G FR**
Type Shape Power Resist- Allowable Others
 and- ance error
 performance

RD : Carbon	2B : 1/8W	F : ±1%	P : Pulse-resistant type
RC : Composition	2E : 1/4W	G : ±2%	NL : Low noise type
RS : Metal oxide film	2H : 1/2W	J : ±5%	NB : Non-burning type
RW : Winding	3A : 1W	K : ±10%	FR : Fuse-resistor
RN : Metal film	3D : 2W	M : ±20%	F : Lead wire forming
RK : Metal mixture	3F : 3W		
	3H : 5W		

* Resistance
1 8 2 ⇒ 1800 ohm = 1.8 kohm
Indicates number of zeros after effective number.
2-digit effective number.
• Units: ohm
1 R 2 ⇒ 1.2 ohm
1-digit effective number.
2-digit effective number, decimal point indicated by R.
• Units: ohm

Capacitors

Ex.: **CE 04W 1H 2B2 M BP**
Type Shape- Dielectric Capacity Allowable Others
 and- strength error
 performance

CE : Aluminum foil electrolytic	0J : 6.3V	F : ±1%	HS : High stability type
CA : Aluminum solid electrolytic	1A : 10V	G : ±2%	BP : Non-polar type
CS : Tantalum electrolytic	1C : 16V	J : ±5%	HR : Ripple-resistant type
CQ : Film	1E : 25V	K : ±10%	DL : For charge and discharge
CK : Ceramic	1V : 35V	M : ±20%	HF : For assuring high frequency
CC : Ceramic	1H : 50V	Z : ±80%	U : UL part
CP : Oil	2A : 100V	-20%	C : CSA part
CM : Mica	2B : 125V	P : ±100%	W : UL-CSA type
CF : Metallized	2C : 160V	-0%	F : Lead wire forming
CH : Metallized	2D : 200V	C : ±0.25pF	
	2E : 250V	D : ±0.5pF	
	2H : 500V	= : Others	
	2J : 630V		

* Capacity (electrolyte only)
2 2 2 ⇒ 2200μF
Indicates number of zeros after effective number.
2-digit effective number.
• Units: μF.
2 R 2 ⇒ 2.2μF
1-digit effective number.
2-digit effective number, decimal point indicated by R.
• Units: μF.
* Capacity (except electrolyte)
2 2 2 ⇒ 2200pF=0.0022μF
(More than 2) — Indicates number of zeros after effective number.
2-digit effective number.
• Units: pF.
2 2 1 ⇒ 220pF
(0 or 1) — Indicates number of zeros after effective number.
2-digit effective number.
• Units: pF.
• When the dielectric strength is indicated in AC, "AC" is included after the dielectric strength value.

P.W.B. UNIT ASS'Y PARTS LIST
TUNER UNIT ASS'Y

Ref. No.	Part No.	Part Name	Remarks	Ref. No.	Part No.	Part Name	Remarks
SEMICONDUCTORS							
Δ IC001	268 0073 905	IC ICP-N15	IC protector	D104,105	960 0031 409	Diode 1SS131	
Δ IC003	263 0567 005	IC NJM78M05FA	Regulator +5V	D106~110	960 0031 409	Diode 1SS131	
Δ IC004	960 0008 607	IC KIA7812A	Regulator +12V	D111~114	960 0031 409	Diode 1SS131	
or	—	IC JRC7812	Regulator +12V	D301~304	960 0031 409	Diode 1SS131	
IC101	263 0421 002	IC LA1267S	Linear RF	D410~413	960 0031 409	Diode 1SS131	
IC102	263 0584 004	IC LA3410	Linear RF	D420,421	960 0031 409	Diode 1SS131	
IC103	262 0703 002	IC LM7000	Linear IC	D423,424	960 0031 409	Diode 1SS131	
IC201	262 1827 000	IC SAA6579T	Demodulator	D503	276 0401 002	Diode 1SS133	Europe model only
IC202	262 1929 908	IC LC7074NM-TE-R	Europe model only	D507	276 0401 002	Diode 1SS133	
			CPU microprocessor				
IC301		IC TA2040AP	Europe model only	ZD013	276 0636 903	Zener diode MTZJ8.2B	8.2 V
IC501	960 0007 006	IC μPD78044AGF-057-3B9	CPU microprocessor	ZD015	9H3 0000 231	Zener diode MTZJ27B	27 V
Q001,002	273 0178 022	Transistor 2SC1740S(R)		ZD408,409	9H3 0000 509	Zener diode MTZJ6.2B	6.2 V
Q003	271 0110 000	Transistor KSA916(Y)		ZD509	9H3 0000 509	Zener diode MTZJ6.2B	6.2 V
Q004	271 0192 002	Transistor 2SA933S(S)		FL501	960 0007 103	F.L.D tube 11-BT-127GK	
Q005,006	273 0178 022	Transistor 2SC1740S(R)		RESISTORS			
Q103	960 0008 801	Transistor KTC3194(O)		VR101	211 6075 053	Semifixed resistor 47 kohm	Auto stop level
Q105	269 0046 003	Transistor DTA114ES	Built in resistor	VR102	211 6075 066	Semifixed resistor 220 kohm	Separation
Q106	273 0178 022	Transistor 2SC1740S(R)		R001	241 2402 977	Carbon film 56 kohm 1/6W	RD14B2E563J(5)
Q107	273 0207 003	Transistor KSC1845(F)		R002	241 2402 951	Carbon film 47 kohm 1/6W	RD14B2E473J(5)
Q108	960 0008 801	Transistor KTC3194(O)		R003,004	241 2400 995	Carbon film 10 kohm 1/6W	RD14B2E103J(5)
Q109	269 0046 003	Transistor DTA114ES	Built in resistor	R005	241 2402 977	Carbon film 56 kohm 1/6W	RD14B2E563J(5)
Q110	273 0178 022	Transistor 2SC1740S(R)		R006	241 2318 003	Carbon film 3.9 kohm 1/6W	RD14B2E392F ±1%
Q111	273 0178 022	Transistor 2SC1740S(R)		R007	241 2400 911	Carbon film 4.7 kohm 1/6W	RD14B2E472J(5)
Q112,113	273 0178 022	Transistor 2SC1740S(R)		R008	241 2398 955	Carbon film 1 kohm 1/6W	RD14B2E102J(5)
Q114~117	269 0146 903	Transistor DTC343TS	Built in resistor	R011	241 2402 951	Carbon film 47 kohm 1/6W	RD14B2E473J(5)
Q118,119	269 0046 003	Transistor DTA114ES	Built in resistor	R012	241 2400 911	Carbon film 4.7 kohm 1/6W	RD14B2E472J(5)
Q301		Transistor KTC3198Y		R013	241 2399 954	Carbon film 2.7 kohm 1/6W	RD14B2E272J(5)
Q302	269 0046003	Transistor DTA114ES		R014	241 2400 995	Carbon film 10 kohm 1/6W	RD14B2E103J(5)
Q303	269 0040 902	Transistor DTC144ES		Δ R016	244 0031 006	Metal oxide 150 ohm 1W(NB)	RS14B3A151JNB
Q305~308		Transistor KTC3198Y		R019	241 2402 951	Carbon film 47 kohm 1/6W	RD14B2E473J(5)
Q401	273 0178 022	Transistor 2SC1740S(R)		R022	241 2401 965	Carbon film 20 kohm 1/6W	RD14B2E203J(5)
Q402,403	271 0192 002	Transistor 2SA933S(S)		R023	241 2402 919	Carbon film 33 kohm 1/6W	RD14B2E333J(5)
Q404	269 0040 009	Transistor DTC144ES	Built in resistor	Δ R026	244 0031 006	Metal oxide 150 ohm 1W(NB)	RS14B3A151JNB
Δ D001~005	916 0053 008	Diode 1N4002A	Rectifier	Δ R028	960 9001 809	Fusible 1 ohm 1/4W (FR)	RD14B2E010JFRF
D006,007	960 0031 409	Diode 1SS131		Δ R101	241 2313 008	Fusible 100 ohm 1/4W (FR)	RD14B2E101GFRF
D008,009	916 0053 008	Diode 1N4002A		R102	241 2400 911	Carbon film 4.7 kohm 1/6W	RD14B2E472J(5)
D010	960 0031 409	Diode 1SS131					Europe model only
D012	960 0031 409	Diode 1SS131		R103	241 2400 995	Carbon film 10 kohm 1/6 W	RD14B2E103J(5)
D018	960 0031 409	Diode 1SS131					Europe model only
D020	960 0031 409	Diode 1SS131					

TUNER SECTION

Ref. No.	Part No.	Part Name	Remarks	Ref. No.	Part No.	Part Name	Remarks
R105	241 2397 901	Carbon film 220 ohm 1/6W	RD14B2E221J(5)	R160,161	241 2404 001	Carbon film 200 kohm 1/6W	RD14B2E204J(5)
R107	241 2394 069	Carbon film 22 ohm 1/6W	RD14B2E220J(5)				Europe model
			Europe model	R160,161	241 2403 950	Carbon film 120 kohm 1/6W	RD14B2E124J(5)
R107	241 2395 068	Carbon film 56 ohm 1/6W	RD14B2E560J(5)				Asia model
			Asia model	R162	241 2399 970	Carbon film 3.3 kohm 1/6W	RD14B2E332J(5)
R108	241 2397 943	Carbon film 330 ohm 1/6W	RD14B2E331J(5)	R163,164	241 2401 017	Carbon film 12 kohm 1/6W	RD14B2E123J(5)
R109	241 2396 928	Carbon film 100 ohm 1/6W	RD14B2E101J(5)				Europe model only
R111	241 2397 943	Carbon film 330 ohm 1/6W	RD14B2E331J(5)	R167,168	241 2396 928	Carbon film 100 ohm 1/6W	RD14B2E101J(5)
R114	241 2399 970	Carbon film 3.3 kohm 1/6W	RD14B2E332J(5)	R169,170	241 2401 978	Carbon film 22 kohm 1/6W	RD14B2E223J(5)
R115	241 2398 010	Carbon film 680 ohm 1/6W	RD14B2E681J(5)	R171,172	241 2400 034	Carbon film 5.6 kohm 1/6W	RD14B2E562J(5)
R116,117	241 2400 995	Carbon film 10 kohm 1/6W	RD14B2E103J(5)	R177-180	241 2397 972	Carbon film 470 ohm 1/6W	RD14B2E471J(5)
R118	241 2396 009	Carbon film 82 ohm 1/6W	RD14B2E820J(5)	R181,182	241 2403 934	Carbon film 100 kohm 1/6W	RD14B2E104J(5)
R119	241 2397 082	Carbon film 5.1 kohm 1/6W	RD14B2E512J(5)	R185	241 2400 034	Carbon film 5.6 kohm 1/6W	RD14B2E562J(5)
R120	241 2397 972	Carbon film 470 ohm 1/6W	RD14B2E471J(5)	R187	241 2400 995	Carbon film 10 kohm 1/6W	RD14B2E103J(5)
R121	241 2402 016	Carbon film 30 kohm 1/6W	RD14B2E303J(5)	R188	241 2400 995	Carbon film 10 kohm 1/6W	RD14B2E103J(5)
			Europe model				
R121	241 2401 936	Carbon film 15 kohm 1/6W	RD14B2E153J(5)	R204	241 2405 974	Carbon film 1 Mohm 1/6W	RD14B2E105J(5)
			Asia model				Europe model only
R122-124	241 2400 995	Carbon film 10 kohm 1/6W	RD14B2E103J(5)	R205	241 2398 955	Carbon film 1 kohm 1/6W	RD14B2E102J(5)
R125	241 2399 970	Carbon film 3.3 kohm 1/6W	RD14B2E332J(5)				Europe model only
R126	241 2402 951	Carbon film 47 kohm 1/6W	RD14B2E473J(5)				
R127	241 2399 954	Carbon film 2.7 kohm 1/6W	RD14B2E272J(5)	R408,409	241 2401 978	Carbon film 22 kohm 1/6W	RD14B2E223J(5)
R128	241 2401 978	Carbon film 22 kohm 1/6W	RD14B2E223J(5)	R410,411	241 2400 995	Carbon film 10 kohm 1/6W	RD14B2E103J(5)
R129	241 2403 934	Carbon film 100 kohm 1/6W	RD14B2E104J(5)	R412,413	241 2401 978	Carbon film 22 kohm 1/6W	RD14B2E223J(5)
R131	241 2400 979	Carbon film 8.2 kohm 1/6W	RD14B2E822J(5)	R414	241 2397 901	Carbon film 220 ohm 1/6W	RD14B2E221J(5)
R133	241 2399 970	Carbon film 3.3 kohm 1/6W	RD14B2E332J(5)	R415,416	241 2402 951	Carbon film 47 kohm 1/6W	RD14B2E473J(5)
R134	241 2399 912	Carbon film 1.8 kohm 1/6W	RD14B2E182J(5)	R417	241 2401 978	Carbon film 22 kohm 1/6W	RD14B2E223J(5)
△ R136	241 2313 008	Fusible 100 ohm 1/4W (FR)	RD14B2E101GFRF	R418	241 2398 955	Carbon film 1 kohm 1/6W	RD14B2E102J(5)
R137	241 2400 995	Carbon film 10 kohm 1/6W	RD14B2E103J(5)	R419	241 2401 978	Carbon film 22 kohm 1/6W	RD14B2E223J(5)
△ R138	241 2315 019	Fusible 10 ohm 1/4W (FR)	RD14B2E100GFRF	R420	241 2396 928	Carbon film 100 ohm 1/6W	RD14B2E101J(5)
R139	241 2400 995	Carbon film 10 kohm 1/6W	RD14B2E103J(5)	R421	241 2400 995	Carbon film 10 kohm 1/6W	RD14B2E103J(5)
R140	241 2403 073	Carbon film 150 kohm 1/6W	RD14B2E154J(5)	R422	241 2405 974	Carbon film 1 Mohm 1/6W	RD14B2E105J(5)
R141,142	241 2398 955	Carbon film 1 kohm 1/6W	RD14B2E102J(5)				
R143	241 2402 993	Carbon film 68 kohm 1/6W	RD14B2E683J(5)	R501,502	241 2396 960	Carbon film 150 ohm 1/6W	RD14B2E151J(5)
R145	241 2400 995	Carbon film 10 kohm 1/6W	RD14B2E103J(5)	R503	241 2396 083	Carbon film 180 ohm 1/6W	RD14B2E181J(5)
R146	241 2401 978	Carbon film 22 kohm 1/6W	RD14B2E223J(5)	R504	241 2397 927	Carbon film 270 ohm 1/6W	RD14B2E271J(5)
R147	241 2400 995	Carbon film 10 kohm 1/6W	RD14B2E103J(5)	R505	241 2397 066	Carbon film 390 ohm 1/6W	RD14B2E391J(5)
R149	241 2400 034	Carbon film 5.6 kohm 1/6W	RD14B2E562J(5)	R506	241 2398 010	Carbon film 680 ohm 1/6W	RD14B2E681J(5)
R150	241 2399 970	Carbon film 3.3 kohm 1/6W	RD14B2E332J(5)	R508	241 2398 955	Carbon film 1 kohm 1/6W	RD14B2E102J(5)
			Europe model only	R511-515	241 2398 955	Carbon film 1 kohm 1/6W	RD14B2E102J(5)
△ R151	241 2313 008	Fusible 100 ohm 1/4W (FR)	RD14B2E101GFRF	R519-521	241 2398 955	Carbon film 1 kohm 1/6W	RD14B2E102J(5)
R152	241 2399 938	Carbon film 2.2 kohm 1/6W	RD14B2E222J(5)	R522	241 2405 974	Carbon film 1 Mohm 1/6W	RD14B2E105J(5)
R153	241 2398 955	Carbon film 1 kohm 1/6W	RD14B2E102J(5)	R524-541	241 2402 951	Carbon film 47 kohm 1/6W	RD14B2E473J(5)
R155	241 2403 934	Carbon film 100 kohm 1/6W	RD14B2E104J(5)	R542-550	241 2398 955	Carbon film 1 kohm 1/6W	RD14B2E102J(5)
R156	241 2400 995	Carbon film 10 kohm 1/6W	RD14B2E103J(5)	R556,557	241 2396 928	Carbon film 100 ohm 1/6W	RD14B2E101J(5)
R157,158	241 2403 099	Carbon film 180 kohm 1/6W	RD14B2E184J(5)				
			Europe model				
R157,158	241 2403 950	Carbon film 120 kohm 1/6W	RD14B2E124J(5)				
			Asia model				
R159	241 2399 970	Carbon film 3.3 kohm 1/6W	RD14B2E332J(5)				

CAPACITORS

△ C001-004	960 9001 100	Ceramic cap. 0.01 μ F/500V	CK45F2H103Z
C005	254 4260 045	Electrolytic 1 μ F/50V	CE04W1H010M
C006	254 4256 091	Electrolytic 2200 μ F/25V	CE04W1E222MC
C007	253 1174 018	Ceramic cap. 0.01 μ F/16V	CK14Y1C103M
C008	254 4254 048	Electrolytic 100 μ F/16V	CE04W1C100M

TUNER SECTION

Ref. No.	Part No.	Part Name	Remarks
C009	253 1174 018	Ceramic cap. 0.01 μ F/16V	CK14Y1C103M
C010	254 4254 048	Electrolytic 100 μ F/16V	CE04W1C100M
C011	960 9001 207	Ceramic cap. 0.022 μF/500V	CK45F2H223Z
C018	253 1027 000	Ceramic cap. 0.1 μ F/50V	CK45F1H104Z
C019	254 4261 028	Electrolytic 100 μ F/50V	CE04W1H101M
C020	254 4260 087	Electrolytic 10 μ F/50V	CE04W1H100M
C021	254 4260 045	Electrolytic 1 μ F/50V	CE04W1H010M
C022	254 4261 028	Electrolytic 100 μ F/50V	CE04W1H101M
C023	960 9001 100	Ceramic cap. 0.01 μF/500V	CK45F2H103Z
C024	253 1027 000	Ceramic cap. 0.1 μ F/50V	CK45F1H104Z
C025	253 1174 018	Ceramic cap. 0.01 μ F/16V	CK14Y1C103M
C103	254 4260 087	Electrolytic 10 μ F/50V	CE04W1H100M Europe model only
C104	254 4260 045	Electrolytic 1 μ F/50V	CE04W1H010M
C105	253 1174 018	Ceramic cap. 0.01 μ F/16V	CK14Y1C103M
C106	254 4260 087	Electrolytic 10 μ F/50V	CE04W1H100M
C107	253 1174 018	Ceramic cap. 0.01 μ F/16V	CK14Y1C103M
C109	254 4254 048	Electrolytic 100 μ F/16V	CE04W1C100M
C115	253 1174 018	Ceramic cap. 0.01 μ F/16V	CK14Y1C103M
C116	253 9030 086	Ceramic cap. 0.022 μ F/25V	CK45=1E223K
C117	254 4260 087	Electrolytic 10 μ F/50V	CE04W1H100M
C118,119	253 9030 086	Ceramic cap. 0.022 μ F/25V	CK45=1E223K
C120	253 4342 012	Ceramic cap. 10 pF/50V	CC45SL1H100C
C121	253 1174 018	Ceramic cap. 0.01 μ F/16V	CK14Y1C103M
C122	253 1055 069	Ceramic cap. 100 pF/50V	CK45B1H101K
C123	254 4260 087	Electrolytic 10 μ F/50V	CE04W1H100M
C124	253 3611 003	Ceramic cap. 22 pF/50V	CC45SL1H220J
C125	254 4260 074	Electrolytic 4.7 μ F/50V	CE04W1H4R7M
C126	254 4260 061	Electrolytic 3.3 μ F/50V	CE04W1H3R3M
C127	254 4260 087	Electrolytic 10 μ F/50V	CE04W1H100M
C128	253 1004 007	Ceramic cap. 1000 pF/50V	CK45B1H102K
C129	255 1121 041	Film cap. 0.015 μ F/50V	CQ93M1H153J
C130	253 1027 000	Ceramic cap. 0.1 μ F/50V	CK45F1H104Z
C131	254 4260 061	Electrolytic 3.3 μ F/50V	CE04W1H3R3M
C132	253 3615 009	Ceramic cap. 33 pF/50V	CC45SL1H330J
C133	253 1055 014	Ceramic cap. 560 pF/50V	CK45B1H561K Europe model only
C134	253 3607 004	Ceramic cap. 15 pF/50V	CC45SL1H150J
C135	253 3599 002	Ceramic cap. 6 pF/50V	CC45SL1H060D
C136	253 1026 001	Ceramic cap. 0.047 μ F/50V	CK45F1H473Z
C138	253 1174 018	Ceramic cap. 0.01 μ F/16V	CK14Y1C103M
C139	253 9030 086	Ceramic 0.02 μ F/25V	CK45=1E223K
C142	254 4260 045	Electrolytic 1 μ F/50V	CE04W1H010M
C143	255 1121 078	Film cap. 0.027 μ F/50V	CQ93M1H273J
C144	254 4254 035	Electrolytic 47 μ F/16V	CE04W1C470M
C146	253 1174 018	Ceramic cap. 0.01 μ F/16V	CK14Y1C103M
C147	254 4254 035	Electrolytic 47 μ F/16V	CE04W1C470M
C148,149	253 3611 003	Ceramic cap. 22 pF/50V	CC45SL1H220J
C150	253 1055 069	Ceramic cap. 100 pF/50V	CK45B1H101K
C153	253 1174 018	Ceramic cap. 0.01 μ F/16V	CK14Y1C103M
C155	254 4260 045	Electrolytic 1 μ F/50V	CE04W1H010M

Ref. No.	Part No.	Part Name	Remarks
C156	254 4260 087	Electrolytic 10 μ F/50V	CE04W1H100M
C157	255 4224 903	Film cap. 0.047 μ F/50V	CQ92M1H473J(MRZ)
C158	254 4260 061	Electrolytic 3.3 μ F/50V	CE04W1H3R3M
C159	254 3056 001	Electrolytic 0.47 μ F/50V(Bipolar)	CE04D1HR47MBP
C161	254 4260 045	Electrolytic 1 μ F/50V	CE04W1H010M
C162	254 4254 035	Electrolytic 47 μ F/16V	CE04W1C470M
C163	253 1174 018	Ceramic cap. 0.01 μ F/16V	CK14Y1C103M
C164	253 1001 000	Ceramic cap. 330 pF/50V	CK45B1H331K
C165,166	253 1055 001	Ceramic cap. 270 pF/50V	CK45B1H271K Europe model
C165,166	253 1002 009	Ceramic cap. 470 pF/50V	CK45B1H471K Asia model
C167,168	253 1173 941	Ceramic cap. 2700 pF/16V	CK14X1C272K Europe model only
C169,170	255 1264 953	Filmcap 2700 pF/50V	CQ93M1H272J Europe model only
C171,172	253 1173 909	Ceramic cap. 1200 pF/16V	CK14X1C122M Europe model only
C173	254 4254 035	Electrolytic 47 μ F/16V	CE04W1C470M Europe model only
C174,175	254 4260 058	Electrolytic 2.2 μ F/50V	CE04W1H2R2M
C178	253 1010 004	Ceramic cap. 0.01 μ F/50V	CK45B1H103K
C180	254 4254 048	Electrolytic 100 μ F/16V	CE04W1C100M
C181	254 4260 087	Electrolytic 10 μ F/50V	CE04W1H100M
C183,184	253 1004 007	Ceramic cap. 1000 pF/50V	CK45B1H102K Europe model only
C185	253 1055 069	Ceramic cap. 100 pF/50V	CK45B1H101K
C201,202	253 3613 001	Ceramic cap. 27 pF/50V	CC45SL1H270J Europe model only
C203	253 1055 069	Ceramic cap. 100 pF/50V	CK45B1H101K Europe model only
C204	254 4260 058	Electrolytic 2.2 μ F/50V	CE04W1H2R2M Europe model only
C205	254 4254 035	Electrolytic 47 μ F/16V	CE04W1C470M Europe model only
C206	253 1055 014	Ceramic cap. 560 pF/50V	CK45B1H561K Europe model only
C207	254 4254 035	Electrolytic 47 μ F/16V	CE04W1C470M Europe model only
C210	253 1174 018	Ceramic cap. 0.01 μ F/16V	CK14Y1C103M Europe model only
C211	254 4254 035	Electrolytic 47 μ F/16V	CE04W1C470M Europe model only
C301	253 1174 018	Ceramic 0.01 μ F/16V	CK14Y1C103M
C303	254 4260 045	Electrolytic 1 μ F/50V	CE04W1H010M
C304	253 9030 086	Ceramic 0.022 μ F/25V	CK45=1E223K
C307	254 4260 919	Electrolytic 0.22 μ F/50V	CE04W1HR22M
C308	254 4260 074	Electrolytic 4.7 μ F/50V	CE04W1H4R7M
C309	254 4254 048	Electrolytic 100 μ F/10V	CE04W1A101M
C310	253 1174 018	Ceramic 0.01 μ F/16V	CK14Y1C103M

TUNER SECTION

Ref. No.	Part No.	Part Name	Remarks	Q'ty
C312	253 1174 018	Ceramic 0.01 μ F/16V	CK14Y1C103M	
C313	254 4260 087	Electrolytic 10 μ F/50V	CE04W1H100M (ASF)	
C314, 315	256 1064 979	Metalized 0.1 μ F/50V	CF93A1H104J	
C316	254 4260 074	Electrolytic 4.7 μ F/50V	CE04W1H4R7M	
C317,318	253 1174 018	Ceramic 0.01 μ F/16V	CK14Y1C103M	
C319-322	254 4260 903	Electrolytic 0.1 μ F/50V	CE04W1H0R1M	
C323,324		Ceramic 2200 pF/16V	CK14Y1C222M	
C325,326	255 1120 097	Mylar film 5600 pF/50V	CQ93M1H562J	
C327-330	255 1120 055	Mylar film 2700 pF/50V	CQ93M1H272J	
C331,332	254 4260 045	Electrolytic 1 μ F/50V	CE04W1H010M	
C403	253 1004 007	Ceramic cap. 1000 pF/50V	CK45B1H102K	
C405	253 1004 007	Ceramic cap. 1000 pF/50V	CK45B1H102K	
C406	253 1010 004	Ceramic cap. 0.01 μ F/50V	CK45B1H103K	
C407	254 4260 074	Electrolytic 4.7 μ F/50V	CE04W1H4R7M	
C501	253 9030 086	Ceramic cap. 0.022 μ F/25V	CK45-1E223K	
C502,503	253 1004 007	Ceramic cap. 1000 pF/50V	CK45B1H102K	
C504	253 1174 018	Ceramic cap. 0.01 μ F/16V	CK14Y1C103M	
C505	254 4252 037	Electrolytic 100 μ F/10V	CE04W1A101M	
C506	253 1174 018	Ceramic cap. 0.01 μ F/16V	CK14Y1C103M	
C507	254 4252 037	Electrolytic 100 μ F/10V	CE04W1A101M	
C508-510	253 1004 007	Ceramic cap. 1000 pF/50V	CK45B1H102K	
C511	960 9001 003	Super cap. 0.047 F/5.5V	for back-up	
C512	253 1174 018	Ceramic cap. 0.01 μ F/16V	CK14Y1C103M	
C513	254 4258 015	Electrolytic 10 μ F/35V	CE04W1V100M	
OTHER PARTS				Q'ty
L101,102	960 0007 310	(P.W.board) Inductor 39 μ H	D33039300052	(1) 2
L103	960 0007 307	Inductor 1 μ H	D3301R070000	1
L104	960 0010 307	Inductor 10 μ H	D33010070052	1
L501-505	960 0007 307	Inductor 1 μ H	D3301R070000	5
T101	960 0007 349	FM IF coil	D95156110000	1
T102	960 0007 352	FM IF coil	D95156120000	1
T103	960 0007 323	MW IF coil	D95050020000	1
T104	960 0007 336	MW IF coil Black	D95050050000	1
T106	960 0037 607	Anti birdie filter	E40312683241	1
			Europe model only	
CF101,102	261 0120 006	FM ceramic filter	SFE10.7MS3GK-A	2
			Europe model	
CF101,102	960 0043 400	FM ceramic filter	SFE10.7MA5	2
			Asia model	
CF103	940 0425 202	AM ceramic filter	BFU450C4N	1
CF105	261 0079 005	Ceramic resonator	CSB456F11	1
X101	960 0008 005	Crystal 7.2 MHz	E8007R200003	1
X201	960 0037 704	Crystal 4.332 MHz	E8004R332001	1
			Europe model only	
Ref. No.	Part No.	Part Name	Remarks	Q'ty
X202	399 9018 003	Ceramic resonator	E83049000001	1
			CST4.00MGW	
			Europe model only	
X301	399 0189 009	Ceramic resonator	CSA3.60MGF	
X401	399 0107 007	Ceramic resonator	E8304R100000	1
			CST4.19MGW	
TU101	960 0037 319	FM tuner pack (FE415-G11)	E90000011000	1
			Europe model	
TU101	960 0037 306	FM tuner pack (FTH3-504VA)	E90000019000	1
			Asia model	
S501-508	DCD 2150 426	Tact switch	G18000027000	8
JACK101	960 0008 209	4 P Ant. terminal	G04010580000	1
JACK102	960 0008 403	2 P pin jack	G60102004400	1
JACK103, 104	960 0004 407	Mini jack 13.5	G40103110201	2
△ OUT101	960 0037 500	AC outlet (3 gang)	G43500003002	1
△ PT001	960 0034 600	Power transformer	820048040001	1
			Europe model	
△ PT001	960 0034 202	Power transformer	820048040003	1
			Asia model	
△ F002	960 0037 102	Fuse T2.5A/250V	G65025225103	1
	960 0005 804	Fuse holder	for F002	2
	—	Fuse label	G64500005001	1
	—	Fuse label	for F002	1
△ SW101	960 0037 403	Slide switch	G06000100001	1
			Asia model only	
△ CN101	—	2P connector base	L10803960201	1
CN501	—	27P FP cable	L13152045270	1
JP501	960 0006 201	27P FP cable L=120 mm	L30112127000	1
JP501	960 0037 908	27P FP cable	L13152044270	1
JP502	—	Vinyl wire Black L=120 mm	841012126000	1
TP001,002	—	Test pin	L421000010000	2
	960 0036 909	Terminal	379000012000	4
	—	Earth plate	447000393000	1
	—	Earth plate	Asia model	
	—	Earth plate	447000528601	1
	—	Earth plate	Europe model	
	960 0007 200	FLD holder	432002015601	1
J001-015	—	Jumper wire	L40200002002	15
J017,018	—	Jumper wire	L40200002002	2
J101-103	—	Jumper wire	L40200002002	3
J106-111	—	Jumper wire	L40200002002	6
J114-124	—	Jumper wire	L40200002002	11
J126-134	—	Jumper wire	L40200002002	9
J136-140	—	Jumper wire	L40200002002	5
J142-144	—	Jumper wire	L40200002002	3
J149	—	Jumper wire	L40200002002	1
J151-169	—	Jumper wire	L40200002002	19

TUNER SECTION

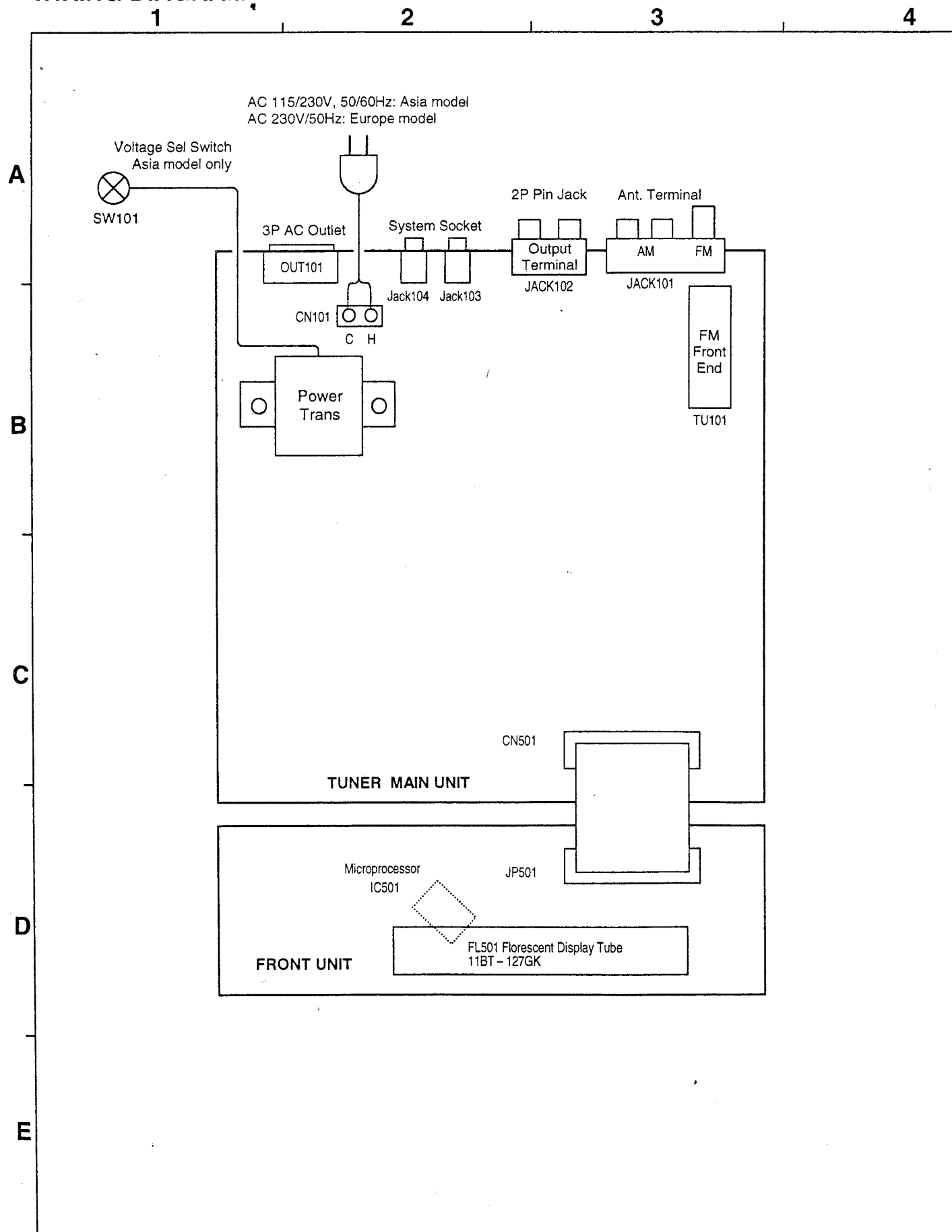
Ref. No.	Part No.	Part Name	Remarks	Q'ty
J171	—	Jumper wire	L40200002002	1
J173-175	—	Jumper wire	L40200002002	3
J177-189	—	Jumper wire	L40200002002	13
J191	—	Jumper wire	L40200002002	1
J200-210	—	Jumper wire	L40200002002	11
J218-224	—	Jumper wire	L40200002002	7
J402,403	—	Jumper wire	L40200002002	2
J502-511	—	Jumper wire	L40200002002	10
J601-603	—	Jumper wire	L40200002002	3
J804-806	—	Jumper wire	L40200002002	3

TUNER SECTION



TUNER SECTION

WIRING DIAGRAM



TUNER SECTION

Contrast list

〈MAIN PARTS〉

TITLE	Asia model	Europe model
R102	X	4.7 kohm
R103	X	10 kohm
R107	56 ohm	22 ohm
R121	15 kohm	30 kohm
R150	X	3.3 kohm
C103	X	10 μ F/50 V
C133	X	470 pF
C183	X	1000 pF
C184	X	1000 pF
CF101	SFE10.7MA5	SFE10.7MS3GK-A
CF102	SFE10.7MA5	SFE10.7MS3GK-A
T106	X	○
△ F001	X	X
△ F002	Fuse 2.5 A/250 V	Fuse 2.5 A/250 V
△ SW101	○	X
J109	○	X
J111	○	X
J112	○	X
J114	○	○
J115	X	○
TU101	960 0037 306	960 0037 319

〈DE-EMPHASIS PARTS〉

TITLE	Asia model	Europe model
R157	120 kohm	180 kohm
R158	120 kohm	180 kohm
R160	120 kohm	200 kohm
R161	120 kohm	200 kohm
C165	470 pF	270 pF
C166	470 pF	270 pF

〈MPX FILTER PARTS〉

TITLE	Asia model	Europe model
R163	X	12 kohm
R164	X	12 kohm
C167	X	2700 pF
C168	X	2700 pF
C169	X	1800 pF
C170	X	1800 pF
C171	X	1200 pF
C172	X	1200 pF
C173	X	47 μ F/16 V
L101	X	39 mH
L102	X	39 mH
J120	○	X
J121	○	X

〈RDS PARTS〉

TITLE	Asia model	Europe model
IC201	X	SAA6579T
IC202	X	LC7074NM
R204	X	1 Mohm
R205	X	1 kohm
C201	X	27 pF
C202	X	27 pF
C203	X	100 pF
C204	X	2.2 μ F/50 V
C205	X	47 μ F/16 V
C206	X	560 pF
C207	X	47 μ F/16 V
C210	X	0.01 μ F
C211	X	47 μ F/16 V
X201	X	Crystal 4.332 MHz
X202	X	Ceramic Resonator CST4.00MGW
J201,202	X	○

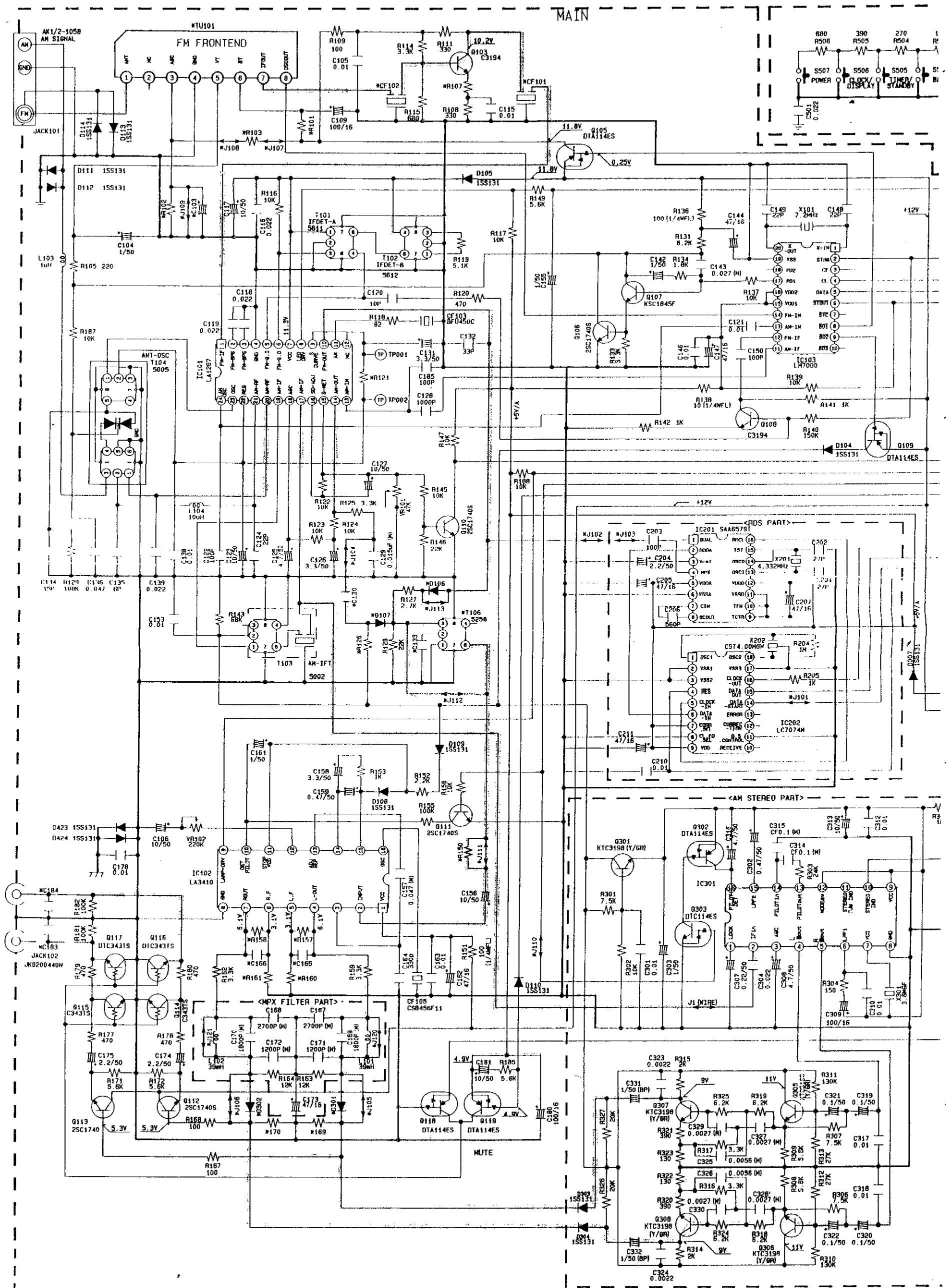
〈OPTION PARTS〉

TITLE	Asia model	Europe model
D502	X	X
D503	X	1SS133
△ PT001	960 0034 202	960 0034 600

TUNER SECTION

NOTE

1 2 3 4 5



6

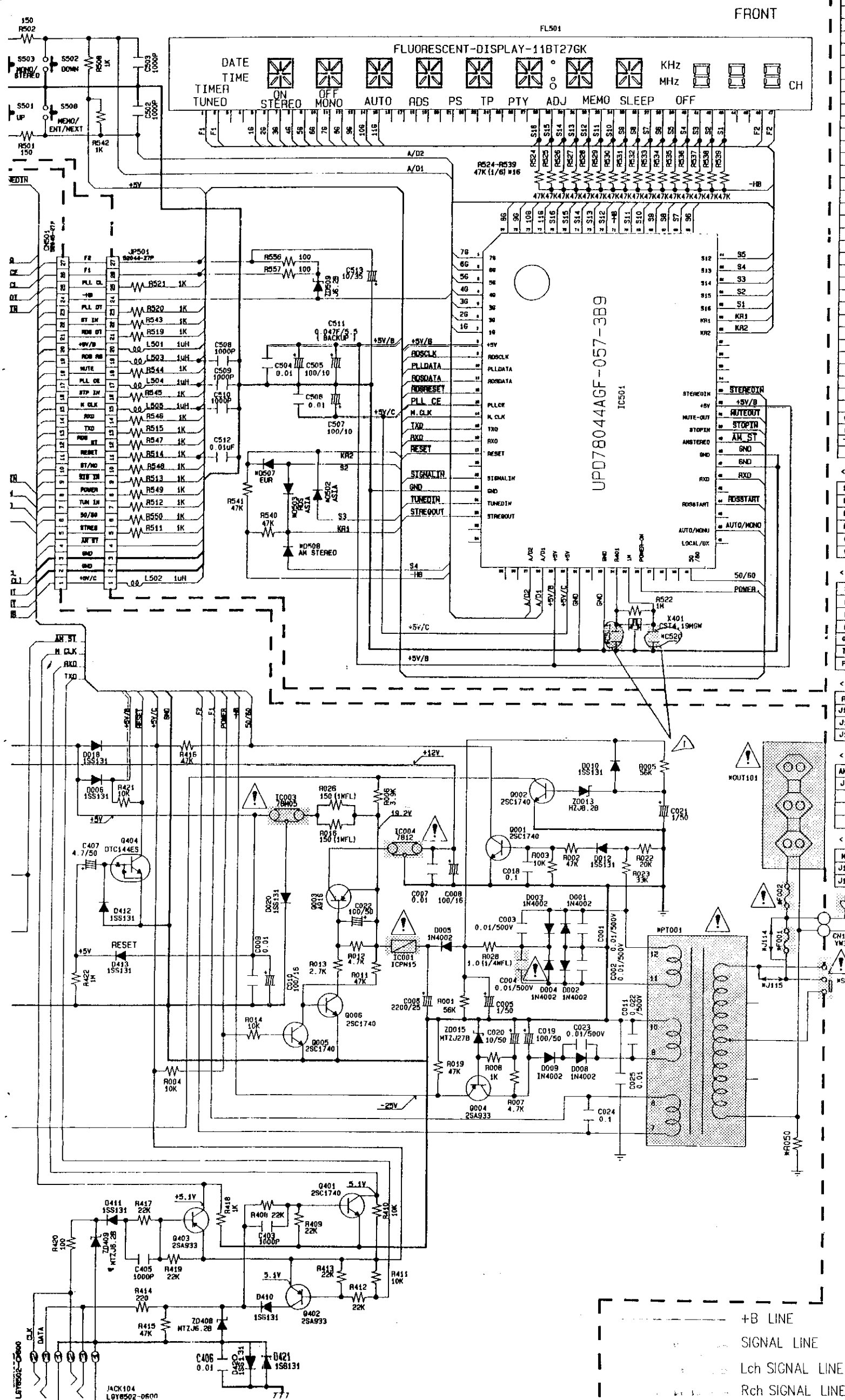
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11



MAIN PARTS

TITLE	JAPAN	ASIA	EUROPE	EK
R101	330 (1/4W)	100 (1/4W)	100 (1/4W)	100 (1/4W)
R102	X	X	4.7K	4.7K
R103	X	X	10K	10K
R107	56	56	22	22
R121	15K	15K	30K	30K
R126	X	47K	47K	47K
R150	X	X	3.3K	3.3K
R169	68K	22K	22K	22K
R170	68K	22K	22K	22K
R250	X	X	X	X
C103	X	X	10/50	10/50
C130	X	0.1uF (50V)	0.1uF (50V)	0.1uF (50V)
C133	X	X	470P	470P
C183	X	X	1000P	1000P
C184	X	X	1000P	1000P
D106	X	1SS131T	1SS131T	1SS131T
D107	X	1SS131T	1SS131T	1SS131T
D301	1SS131T	X	X	X
D302	1SS131T	X	X	X
J113	O	O	X	X
J111	O	O	X	X
J112	O	O	X	X
J106	O	O	O	O
J105	X	O	O	O
J109	O	O	X	X
J114	O	O	O	O
J115	O	X	O	O
J104	X	O	O	O
J108	X	X	O	O
J107	X	X	O	O
SM101	X	O	X	X
T106	X	X	O	O
F001	X	X	X	X
F002	125V/14A	250V/12.5A	250V/12.5A	250V/12.5A
CF102	DEF10-79AB	DEF10-79AB	DEF10-79AB	DEF10-79AB
CF101	DEF10-79AB	DEF10-79AB	DEF10-79AB	DEF10-79AB
C502	X	X	X	X
C501	X	X	X	X

DE-EMPHASIS PARTS

R157	120K	120K	180K	180K
R158	120K	120K	180K	180K
R161	120K	120K	200K	200K
R160	120K	120K	200K	200K
C165	470P	470P	270P	270P
C166	470P	470P	270P	270P

OPTION PARTS

D502	X	1SS131T	X	X
D503	X	1SS131T	1SS131T	1SS131T
D507	X	X	1SS131T	1SS131T
D508	1SS131T	X	X	X
OUT101	DEF10-79AB	DEF10-79AB	DEF10-79AB	DEF10-79AB
TU101	FE340-J04	FE340-J04	FE415-B11	FE415-B11
PT001	48040-004	48040-003	48040-001	48040-001

RDS PARTS

RDS	X	X	X	O
J103	X	X	O	O
J102	X	X	O	O
J101	X	X	O	O

AM STEREO PARTS

AM STEREO	O	X	X	X
J1 (NIRE)	O	X	X	X
J110	O	X	X	X
D303	O	X	X	X
D304	O	X	X	X

MPX FILTER PARTS

MPX	O	X	O	O
J120	X	O	X	X
J121	X	O	X	X

E1: 115, 230V/50, 60Hz
 E2: 230V/50Hz
 E3: 230V/50Hz
 J: 100V/50Hz, 60Hz

NOTES
 ALL RESISTANCE VALUES IN OHM, K, 1,000 OHM, M, 1,000,000 OHM
 ALL CAPACITANCE VALUES IN MICRO FARAD, P, MICRO MICRO FARAD
 EACH VOLTAGE AND CURRENT ARE MEASURED AT NO SIGNAL INPUT
 CONDITION
 CIRCUIT AND PARTS ARE SUBJECT TO CHANGE WITHOUT PRIOR
 NOTICE

WARNING:
 Parts marked with this symbol have critical characteristics.
 Use ONLY replacement parts recommended by the manufacturer.

CAUTION:
 Before returning the unit to the customer, make sure you make either (1) a
 leakage current check or (2) a line to chassis resistance check. If the leakage
 current exceeds 0.5 millamps, or if the resistance from chassis to other side
 of the power cord is less than 240 kohms, the unit is defective.

WARNING:
 DO NOT return the unit to the customer until the problem is located and
 corrected.

+B LINE
 SIGNAL LINE
 Lch SIGNAL LINE
 Rch SIGNAL LINE

PARTS LIST OF EXPLODED VIEW TUNER SECTION (UTU-F88)

Ref. No.	Part No.	Part Name	Remarks	Q'ty
1	—	Main P.W.B. unit Ass'y		1s
1-1	—	Main P.W.B. unit	702802105003 Asia model	
1-1	—	Main P.W.B. unit	702802105002 Europe and U.K. model	(1)
1-2	—	Front P.W.B. unit	702802107103 Asia model	(1)
1-2	—	Front P.W.B. unit	702802107102 Europe and U.K. model	(1)
2	960 0081 501	Front panel	306702089802	1
3	960 0081 608	Inner panel	321702015102	1
4	960 0082 005	Window	507002039201	1
5	960 0079 209	DENON Badge	563000042801	1
6	960 0081 802	Power button	509702002103	1
7	960 0081 705	Knob	508002007101	1
8	960 0003 505	Foot cushion	405002007501	4
9	960 0003 408	Front foot	400700006001	2
10	960 0003 204	Rear foot	400000060001	2
11	960 0007 501	Chassis	320002011601	1
12	960 0003 301	Supporter P.W.B.	407000160101	1
14	960 0081 912	Rear panel	320702010614 Asia model	1
14	960 0081 925	Rear panel	320702010613 Europe and U.K. model	1
Δ 15	960 0032 301	AC Cord	L06100041001 Asia and Europe model	1
Δ 15	960 0032 301	AC Cord	L06100039003 U.K. model	1
Δ 16	960 0003 602	Cord bush	438000018000	1
17	960 0006 308	Top cover	300002009601	1
20	960 0037 306	FM Tuner pack	E90000019000 Asia model	1
20	960 0037 306	FM Tuner pack	E90000011000 Europe and U.K. model	1
21	960 0008 209	4P Ant. terminal	JACK101	1
22	960 0004 407	Mini jack φ3.5	JACK103,104	2
Δ 23	960 0037 500	AC Outlet (3 gang)	OUT101	1
24	960 0008 403	2P Pin jack	JACK102	1
Δ 25	960 0034 202	Power transformer	820048040003 Asia model	1
Δ 25	960 0034 600	Power transformer	820048040001 Europe and U.K. model	1
Δ 27	960 0037 403	Voltage selector	G06000100001 Asia model only	1
51	960 9000 114	Screw 3x8 Btite ZNY/BH	B020030081B1	6
52	960 9000 130	Screw 3x8 Btite BK/FH	B020030083F1	2
53	960 9000 156	Screw 3x17 Btite ZNY/BH	B020030171B1	1
54	960 9000 208	Screw 3x8 Btite BK/BH	B020030083B1 Asia model	22
54	960 9000 208	Screw 3x8 Btite BK/BH	B020030083B1 Europe and U.K. model	20
55	960 9000 169	Screw 4x8 Clite ZNY/BH	B020940081B1	2

A

B

C

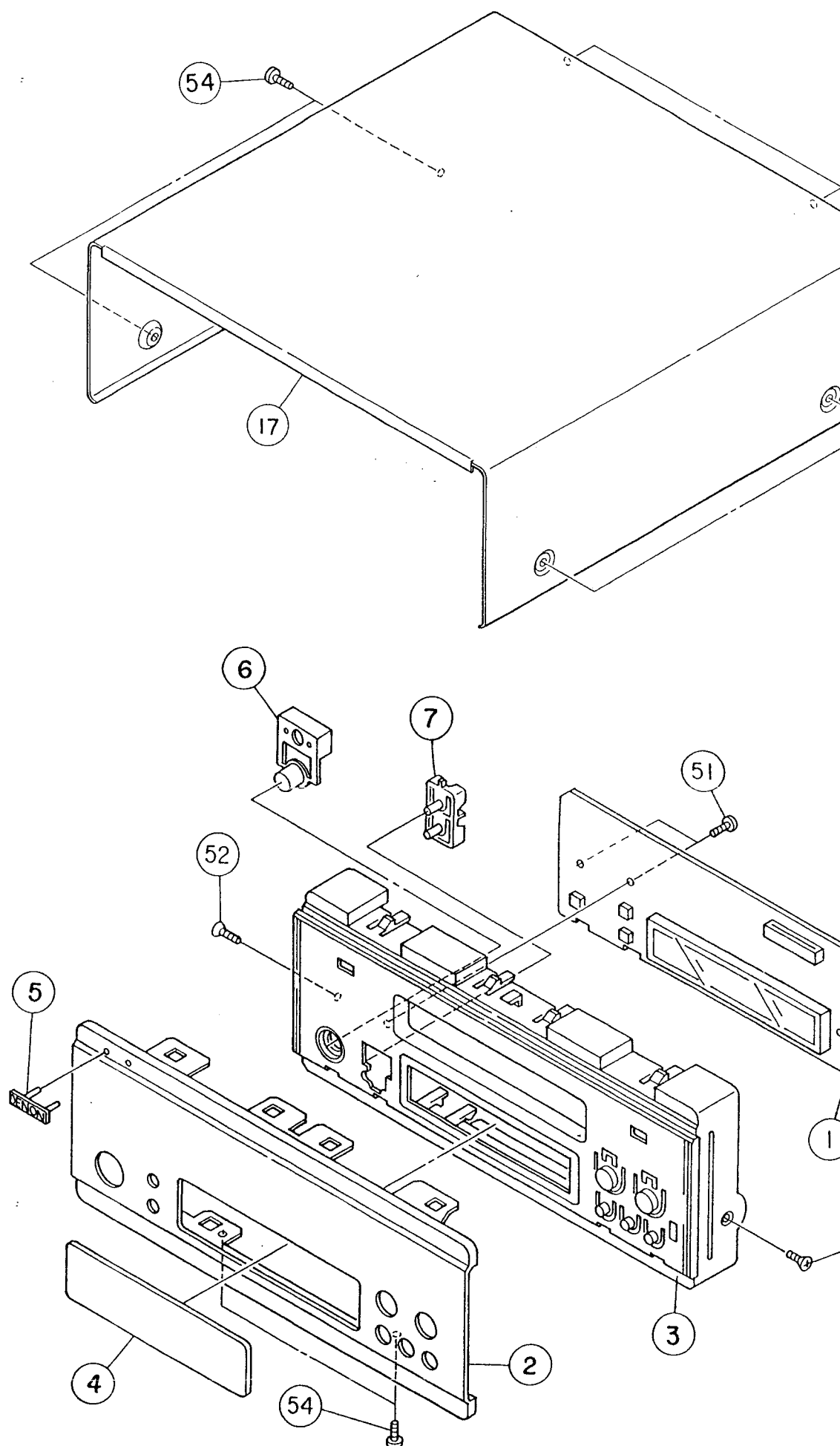
D

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F

G

H



NOTE FOR PARTS LIST

- Part indicated with the mark "⊗" are not always in stock and possibly to take a long period of time for supplying, or some case supplying of part may be refused.
- When ordering of part, clearly indicate "1" and "1" (i) to avoid mis-supplying.
- Ordering part without stating its part number can not be supplied.
- Part indicated with the mark "★" is not illustrated in the exploded view.
- Not including Carbon Film $\pm 5\%$, 1/4W Type in the P.W.Board parts list. (Refer to the Schematic Diagram for those parts)

WARNING:

Parts marked with this symbol Δ have critical characteristics.
Use ONLY replacement parts recommended by the manufacturer.

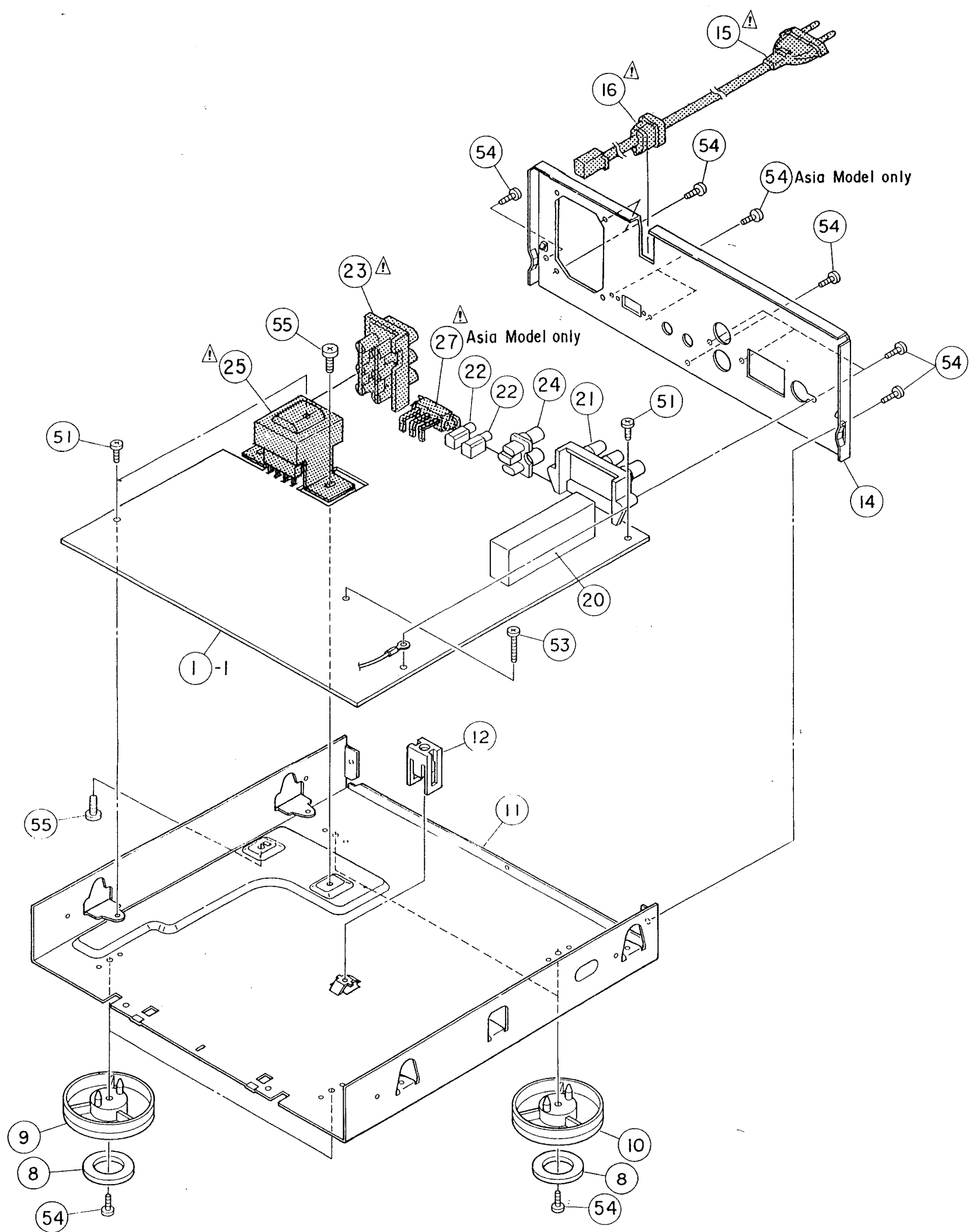
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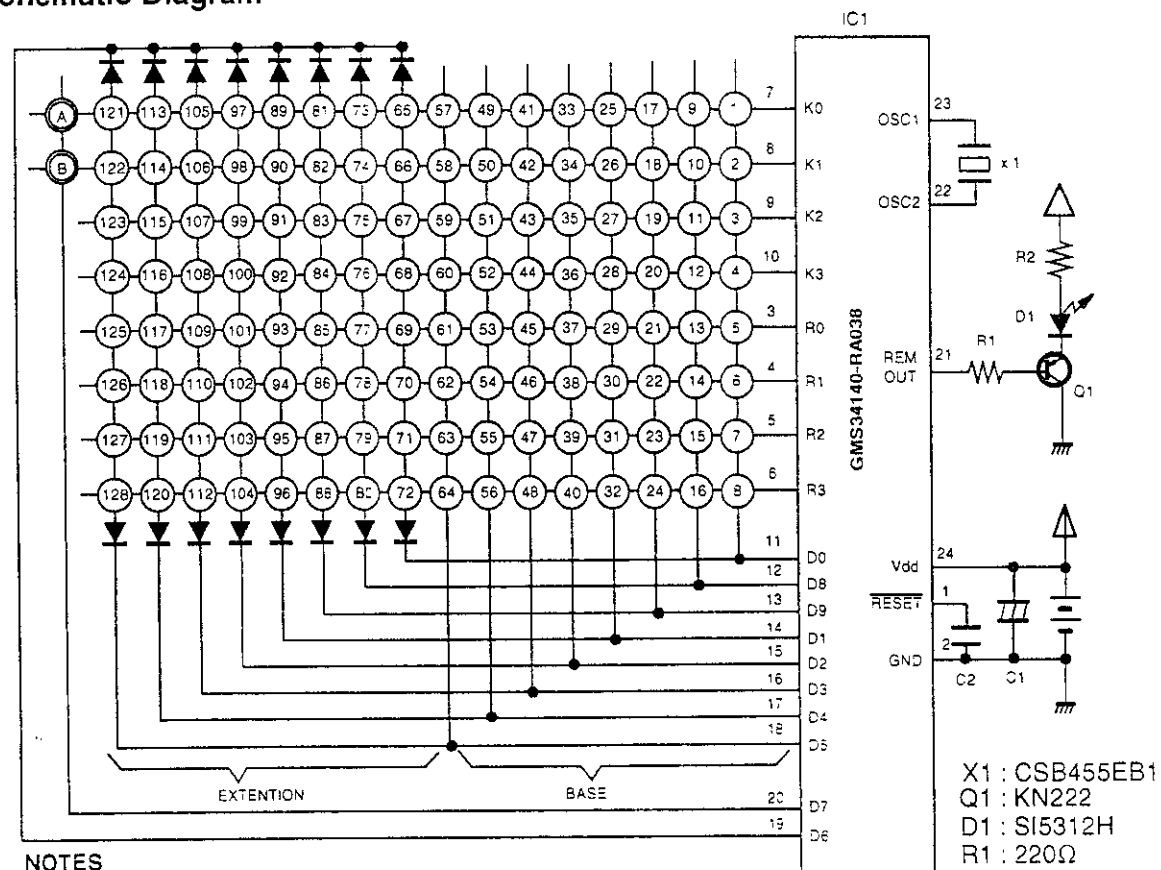
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REMOTE CONTROL UNIT (RC-830: PARTS No. 960 0033 300 Europe model, RC-829: Part No. 960 0006 007 Asia model)

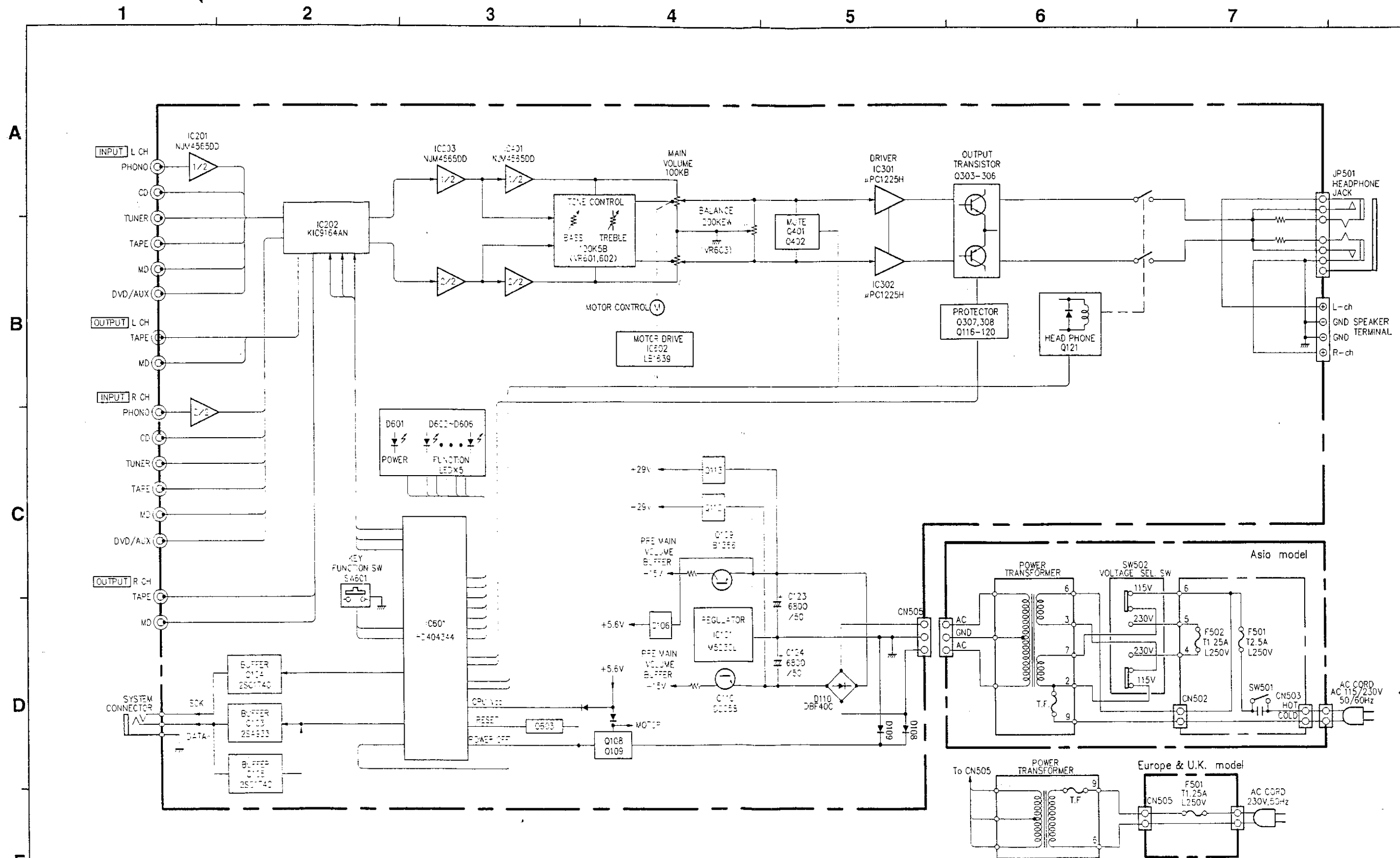
AMPLIFIER SECTION

● Schematic Diagram



AMPLIFIER SECTION

BLOCK DIAGRAM



LEVEL DIAGRAM

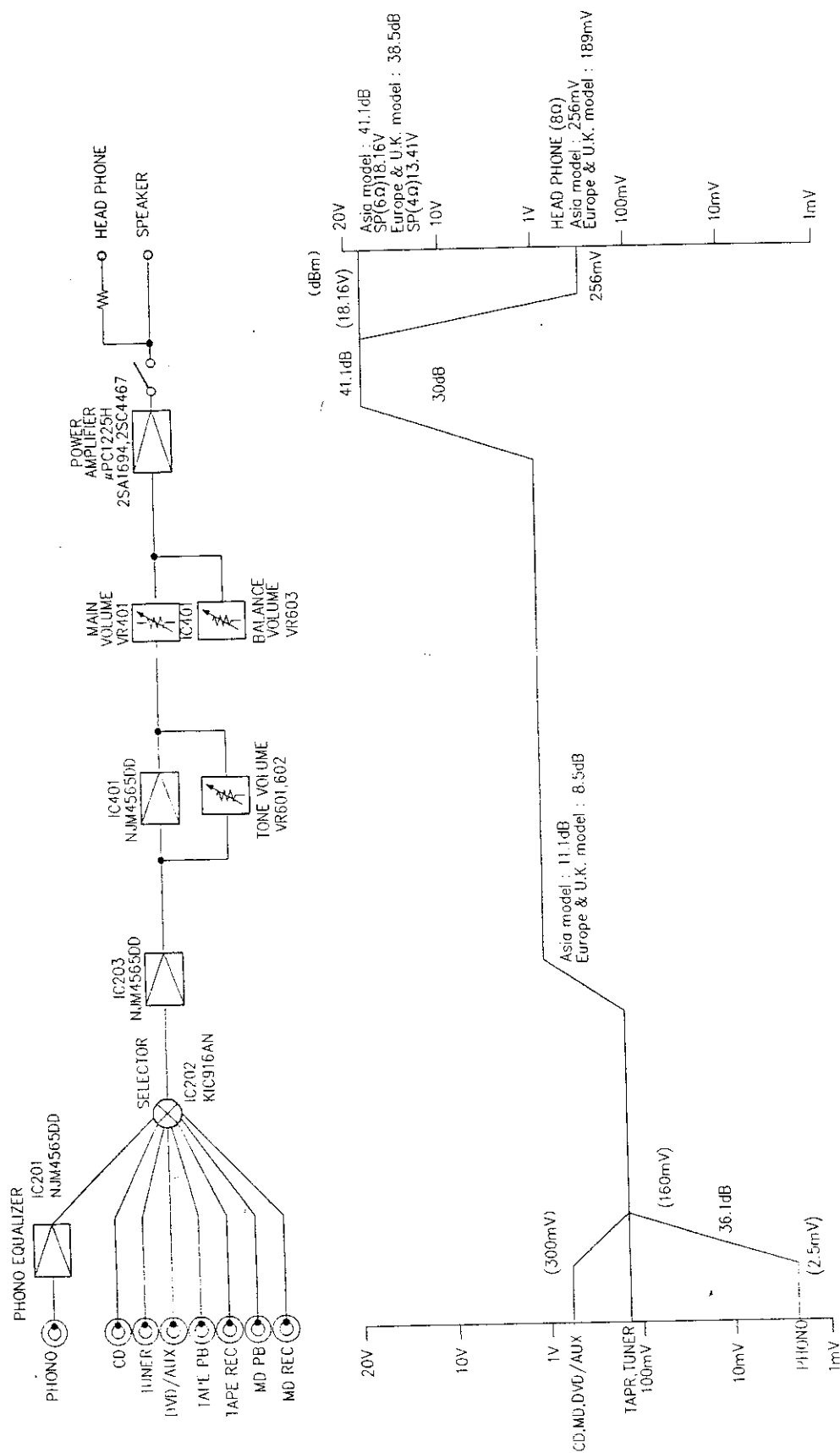
AMPLIFIER SECTION

1

2

3

4



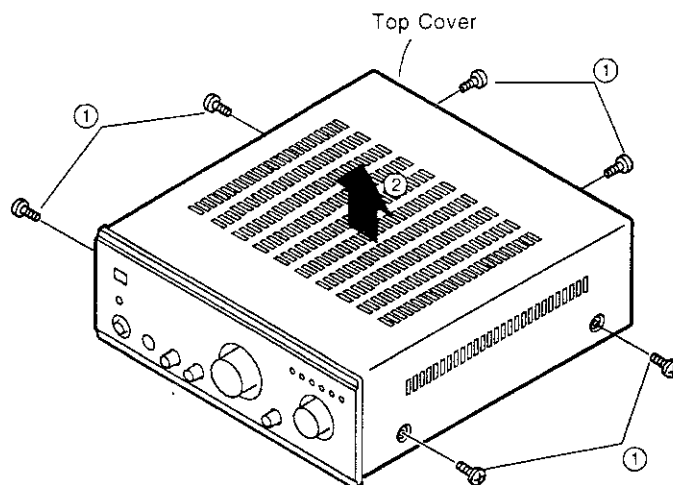
AMPLIFIER SECTION

DISASSEMBLY PROCEDURES

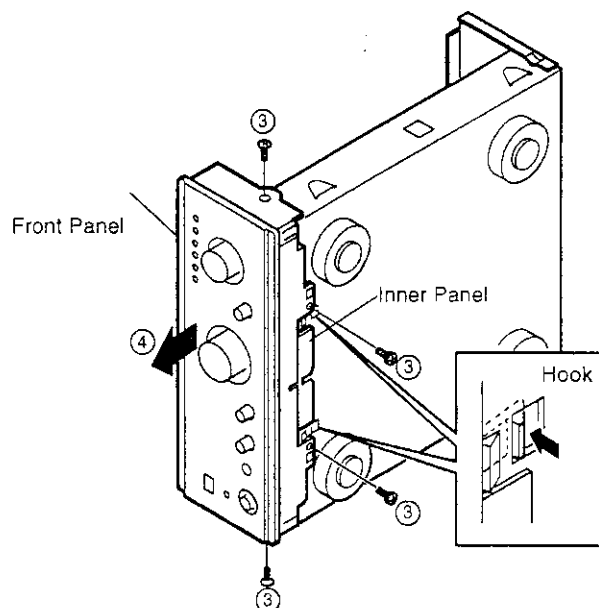
(Assembly is performed in the reverse order.)

1. Top Cover and Front Panel

- ① Remove 6 screws mounting on the Top Cover.
- ② Detach the Top Cover in the arrow direction.



- ③ Remove 2 each screws fastening the Front Panel on the bottom and both side.
- ④ While releasing 2 hooks of the Inner panel from the chassis, pull toward arrow direction and detach the Front Panel and the Inner Panel as a whole.



2. Front Unit Ass'y P.W.B. Unit

● Volume P.W.B. Unit

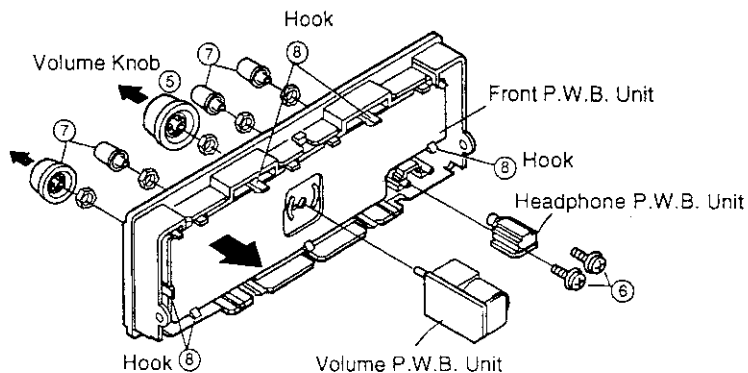
- ⑤ Pull out the Volume Knob as shown in figure, and remove nut, then detach the Volume P.W.B. Unit.

● Headphone P.W.B. Unit

- ⑥ Remove 2 screws mounting Headphone P.W.B. Unit on the Front Panel, then detach the Headphone P.W.B. Unit.

● Front P.W.B. Unit

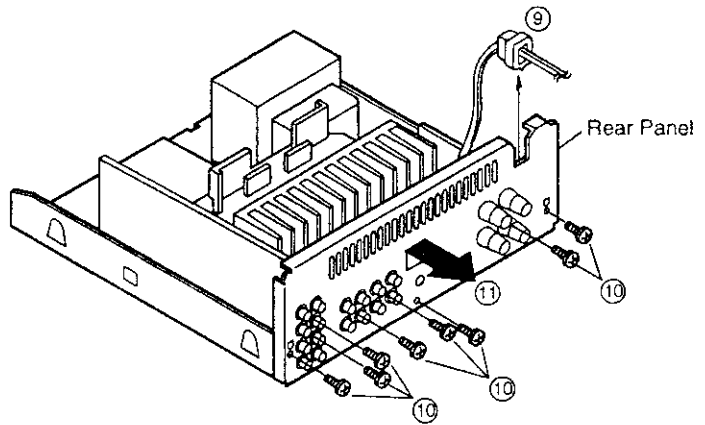
- ⑦ Remove 4 screws fastening the Front Panel P.W.B. Unit.
- ⑧ While releasing 12 hooks, detach the Front P.W.B. Unit in the arrow direction.



AMPLIFIER SECTION

3. Rear Panel

- ⑨ Remove the Cord Bush from the Rear Panel.
- ⑩ Remove 8 screws fixing the Rear Panel.
- ⑪ Detach the Rear Panel in the arrow direction.



4. Main Unit Ass'y P.W.B.

● Amplifier P.W.B. Unit

- ⑫ Remove 2 screws mounting the power Radiator on the chassis.
- ⑬ Detach the Amplifier P.W.B. Unit and the Power Radiator as a whole.

● Function P.W.B. Unit

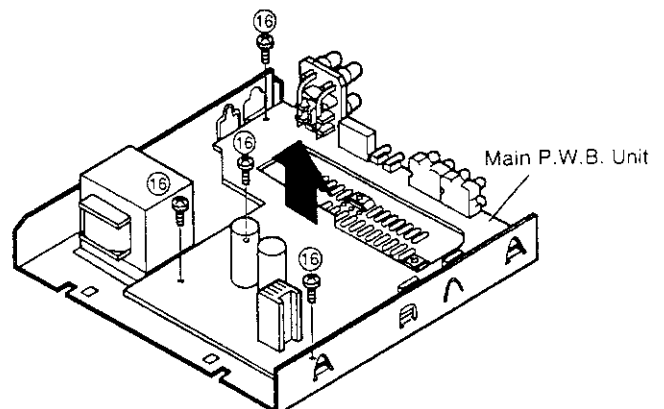
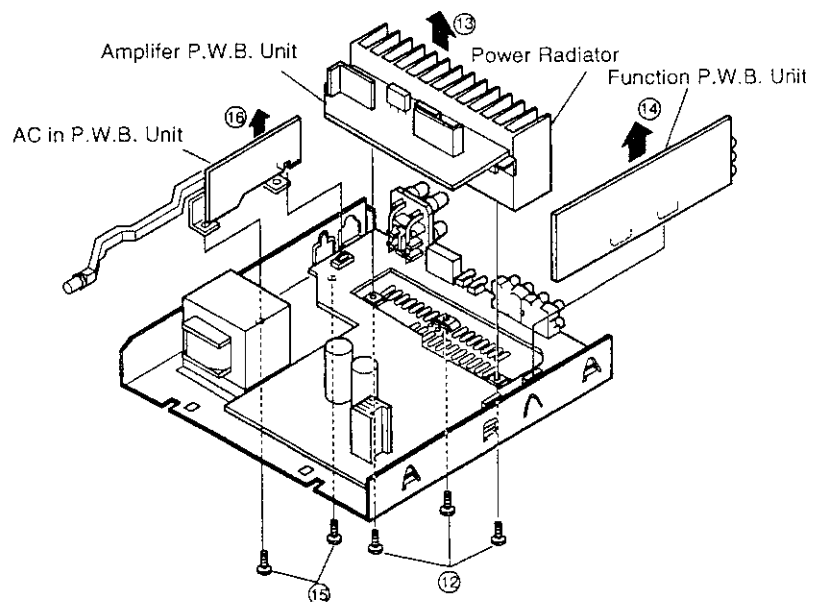
- ⑭ Pull out the Function P.W.B. Unit from connector as shown in figure.

● AC in P.W.B. Unit

- ⑮ Pull out the AC in P.W.B. Unit from connector in the arrow direction.

● Main P.W.B. Unit

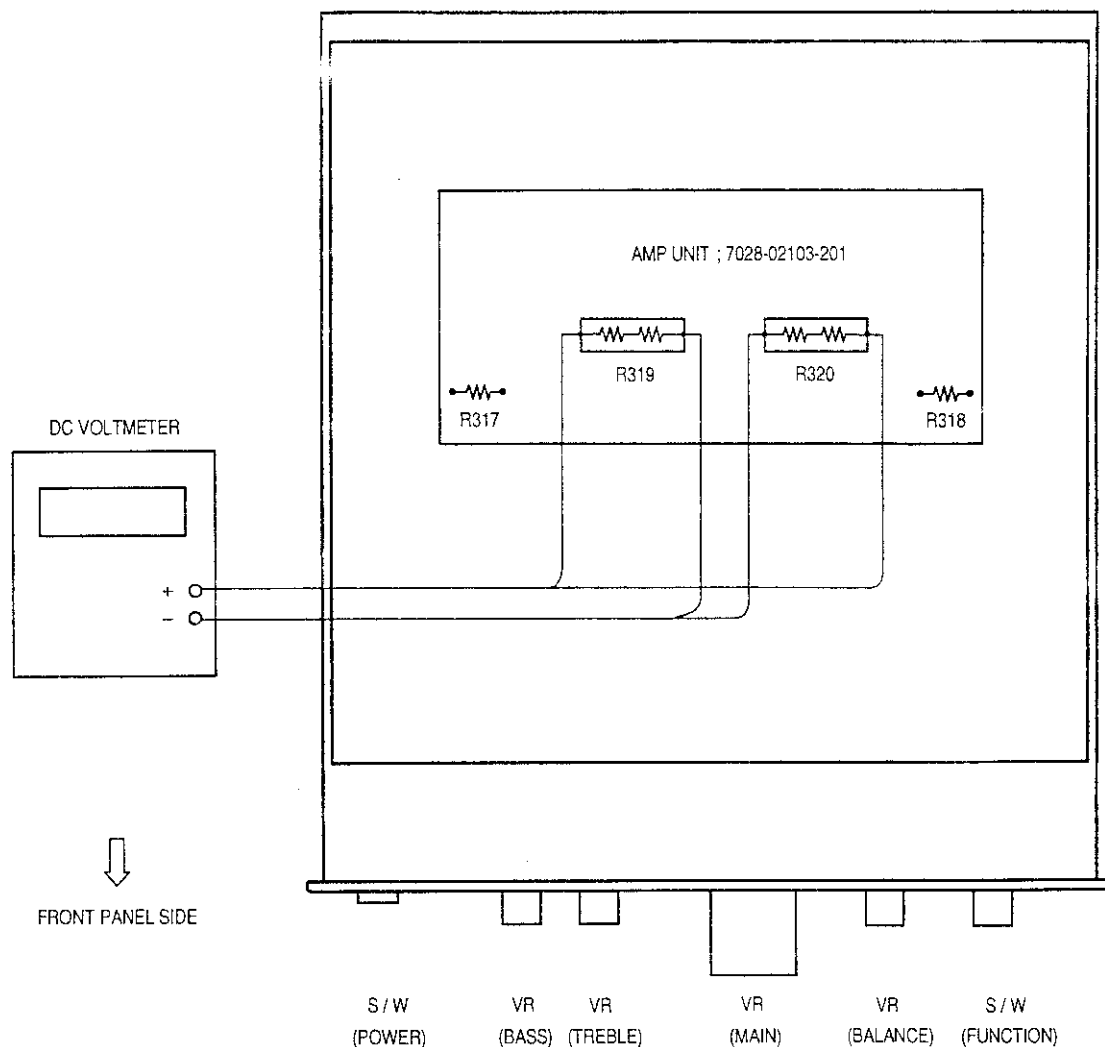
- ⑯ Remove 4 screws fixing the Main P.W.B. Unit, then detach the Main P.W.B. Unit in the arrow direction.



AMPLIFIER SECTION

ADJUSTMENTS

WIRING DIAGRAM



1. Measuring Instruments Required for the Adjustments

- DC voltmeter

2. Preparation

- ① Place the set in a location having normal usage conditions and avoid places with strong drafts such as near coolers or fans. The operating temperature of the set should be between 15 °C and 30 °C and the humidity should be normal.
- ② Set the switches of the set as follows:
 - POWER switch → ON (ON)
 - SPEAKER terminals → No load (Do not connect speakers or dummy resistors)
 - INPUT terminals → No input

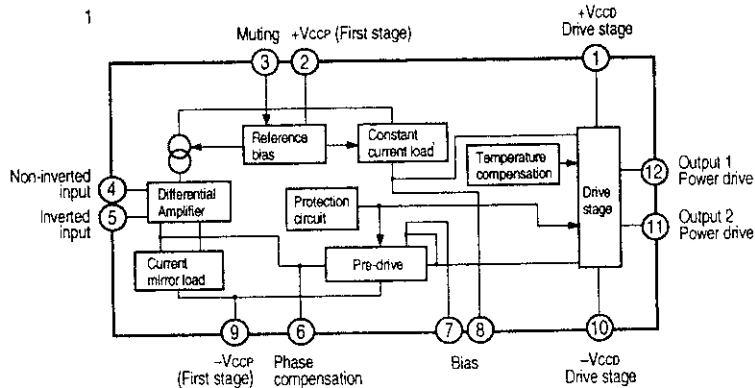
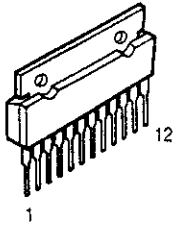
ADJUSTMENTS

- ① Remove the top cover and connect the DC voltmeter to the test points of the Amp. unit (7028-02103-201)
- ② Connect the power cable to a rated voltage AC source and set power switch to "ON (ON)."
- ③ After 10 minutes, read the voltmeter and check that the reading is in the range of 2 mV to 40mV (DC).
- ④ When the value read from the voltmeter is 2 mV or less, cut R317 and R318 (2 kohm) shown in the above diagram.

AMPLIFIER SECTION

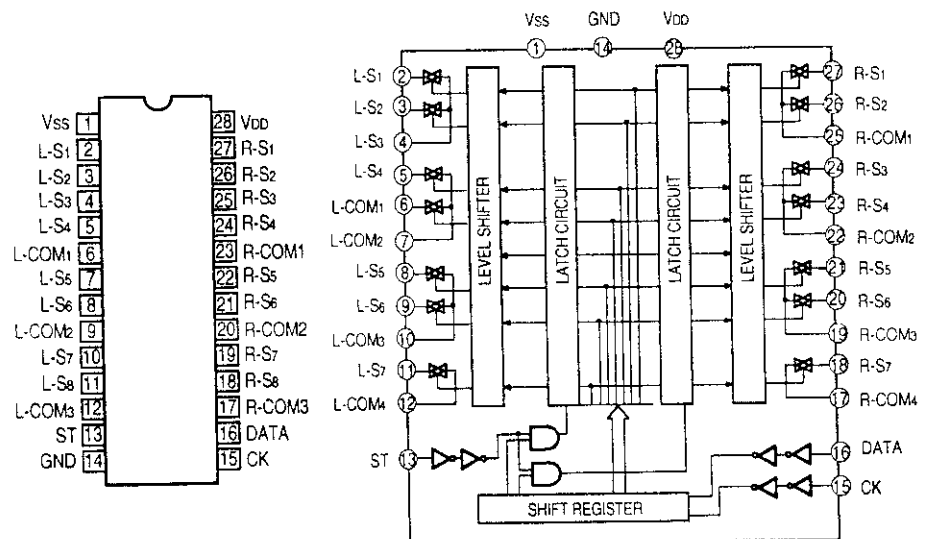
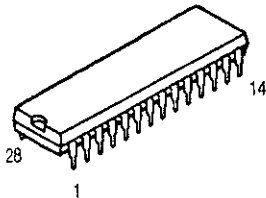
SEMICONDUCTORS

● IC's

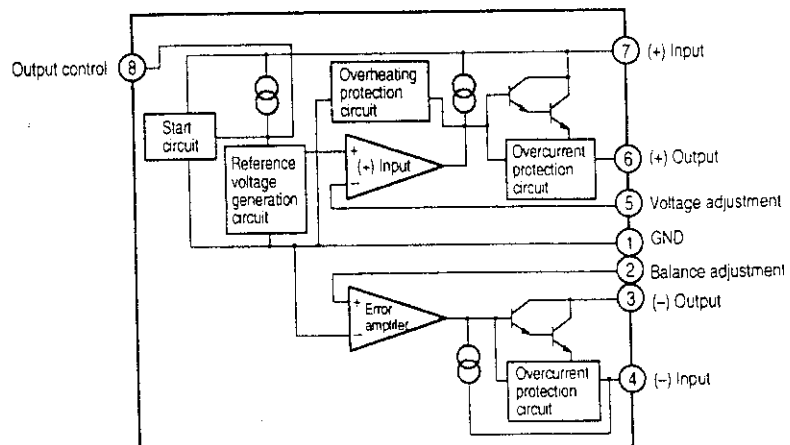
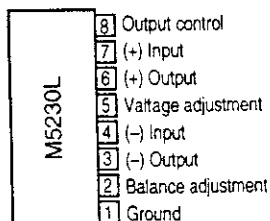
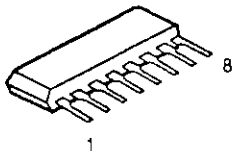
 μ PC1225H(IC301,302) μ PC1225H Function Terminal

Pin No.	Function
1	+Vccp (drive stage power supply)
2	+Vccp (pre-drive stage power supply)
3	MUTING
4	INPUT (non-inverting)
5	NFB (inverting)
6	PHASE COMP
7	BIAS
8	BIAS
9	-Vccp (pre-drive stage power supply)
10	-Vccp (drive stage power supply)
11	LOWER OUTPUT
12	UPPER OUTPUT

KIC9164AN(IC202)

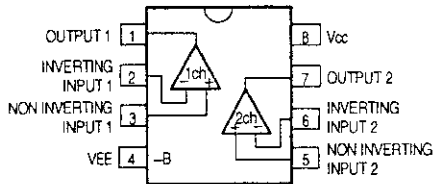
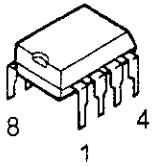


M5230L(IC101)

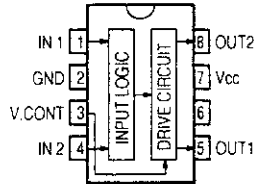
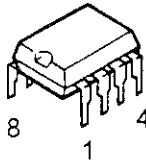


AMPLIFIER SECTION

NJM4565DD (IC201, 203, 401)

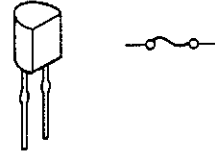


LB1639 (IC602)



● **IC PROTECTOR**

ICP-N15/ICP-F15 (IC102~104)



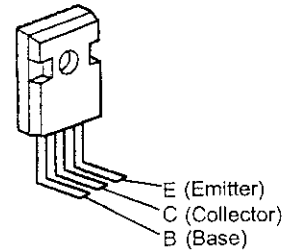
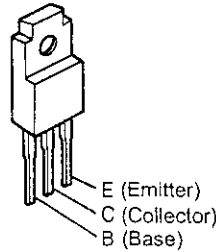
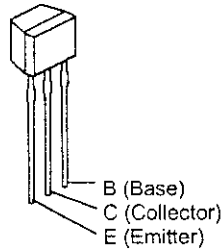
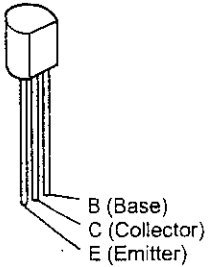
● **TRANSISTORS**

**KSA992 (F)
KSC1845 (F)
KTC2878 (A/B)**

**2SA933S (S)
2SC1740S (R)
2SC1740S (E)**

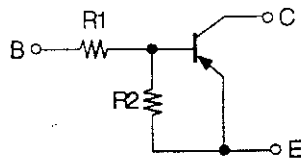
**KTB1366 (Y)
KTD2058 (Y)**

**2SA1694 (O/P/Y)
2SC4467 (O/P/Y)**



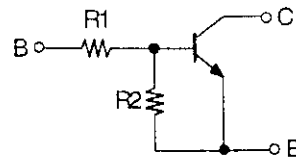
**DTA124ES (PNP)
DTA144ES (PNP)
DTC144ES (NPN)
DTC114ES (NPN)**

**PNP Type
DTA ES Series**

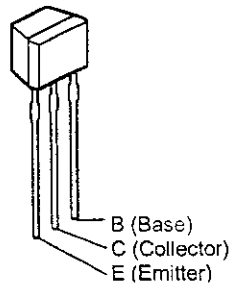


	R1	R2
DTA144ES	47kΩ	47kΩ

**NPN Type
DTC ES Series**



	R1	R2
DTC144ES	47kΩ	47kΩ



AMPLIFIER SECTION

● DIODE (included LED)

1N4002A

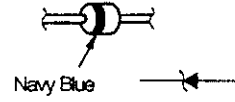
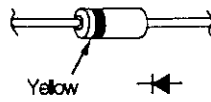
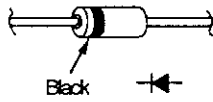
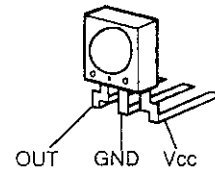
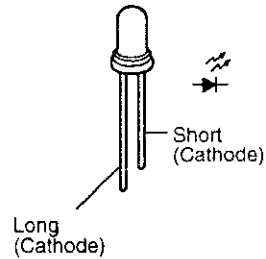
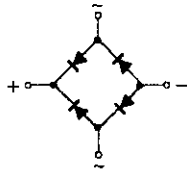
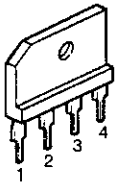
1SS131

MTZJ13B : Europe model

MTZJ6.2B : Asia model

MTZJ12B

MTZJ16B

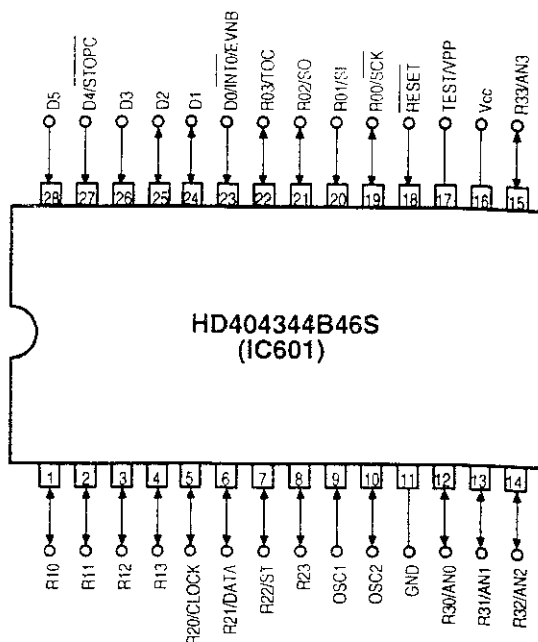
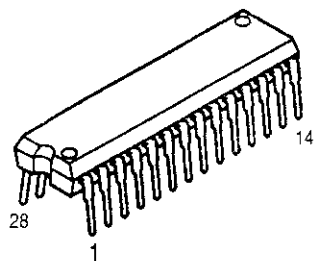
D3SB20/DBF40C
(D110)SLR34DC3
(D602~608)Orange● INFRARED REMOTE
CONTROL SENSORPNA4602M00LB
(A601)

AMPLIFIER SECTION

MICROPROCESSOR DOCUMENTATION

HD404344B46S

(IC601)

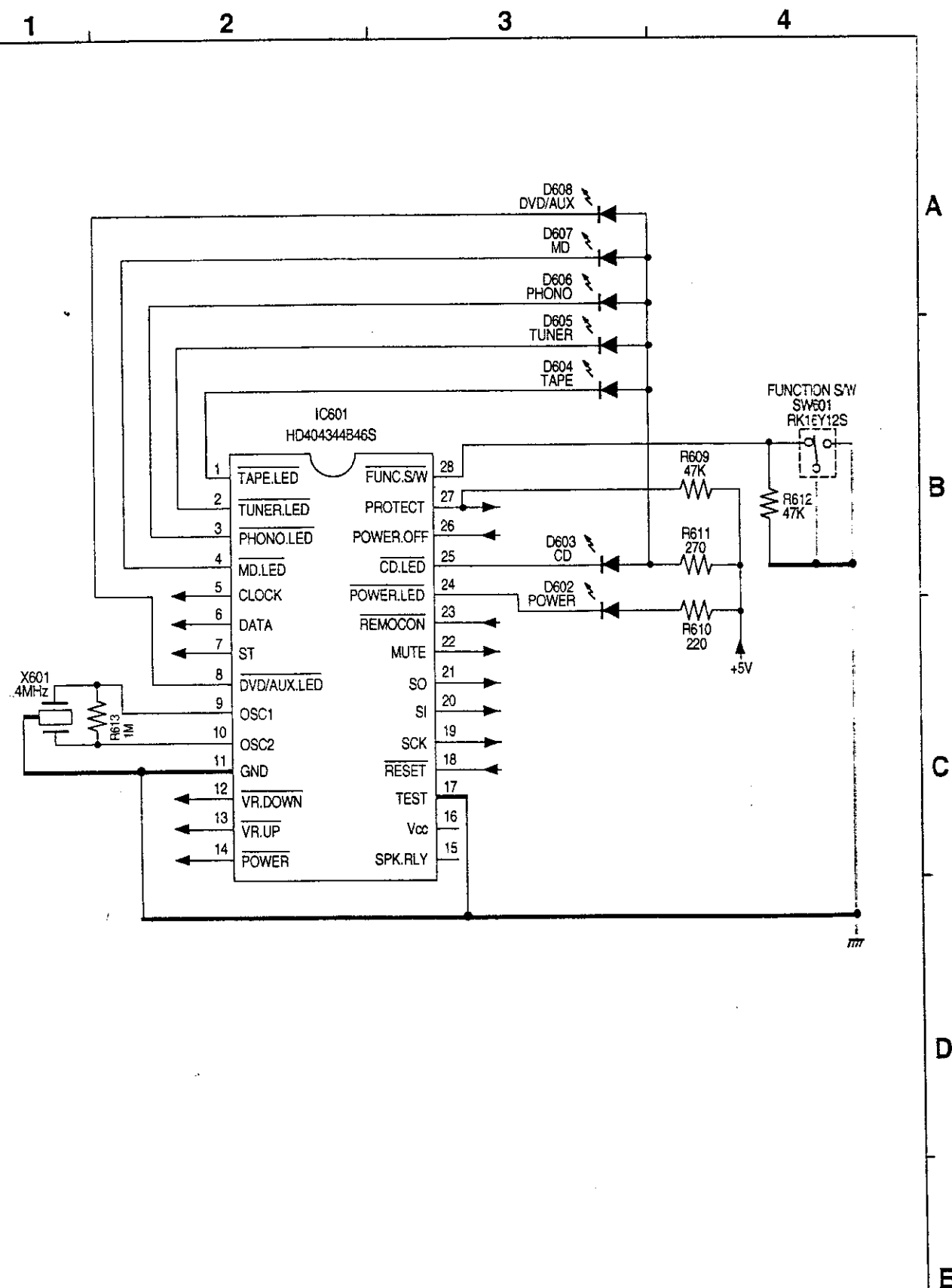


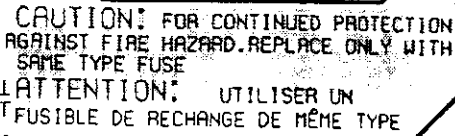
HD404344B46S Terminal Function

No.	Terminal Name	Port Name	I/O	Ini	ACT	Function
1	R10	TAPE LED	O	H	L	LED "TAPE" indication signal. ON at "L"
2	R11	TUNER LED	O	H	L	LED "TUNER" indication signal. ON at "L"
3	R12	PHONO LED	O	H	L	LED "PHONE" indication signal. ON at "L"
4	R13	MD/LED	O	H	L	LED "MD/AUX" indication signal. ON at "L"
5	R20	CLOCK	O	H	—	Serial clock output for IC202.
6	R21	DATA	O	H	—	Serial data output for IC202.
7	R22	ST	O	H	—	Chip enable signal.
8	R23	DVD/AUX LED	O	H	L	Fix to GND.
9	OSC1	OSC IN	I	—	—	Oscillation circuit input.
10	OSC2	OSC OUT	O	—	—	Oscillation circuit output.
11	GND	GND	—	—	—	GND for digital circuit.
12	R30/AN0	VR. DOWN	O	H	L	At volume down, output signal.
13	R31/AN1	VR. UP	O	H	L	At volume up, output signal.
14	R32/AN2	POWER	O	H	L	Control signal of IC101 ($\pm 15V$), IC301/302 (MUTE).
15	R33/AN3	SPK RELAY	O	L	H	ON/OFF control signal of speaker relay.
16	VCC	5V	—	—	—	+5V power supply for digital circuit.
17	TEST/VPP	NC	—	—	—	Fix to GND.
18	RESET	RESET	I	—	L	Reset input signal.
19	R00/SCK	SCK	O	H	L	DENON bus communication data clock signal.
20	R01/SI	SI	I	H	—	DENON bus communication data input signal.
21	R02/SO	SO	O	H	—	DENON bus communication data output signal.
22	R03/OC	MUTE	O	L	H	MUTE output signal.
23	D0/INT0/EVNB	REMOCON	I	H	L	Remote control input signal.
24	D1	POWER. LED	O	H	L	LED "POWER" indication signal. ON at "L"
25	D2	CD. LED	O	H	L	LED "CD" indication signal. ON at "L"
26	D3	POWER OFF	I	H	L	Power OFF input signal.
27	D4	PROTECT	I	L	H	Over flow current detection input signal.
28	D5	FUNC. SW	I	H	L	Function switch signal.

MICROPROCESSOR PERIPHERAL WIRING DIAGRAM

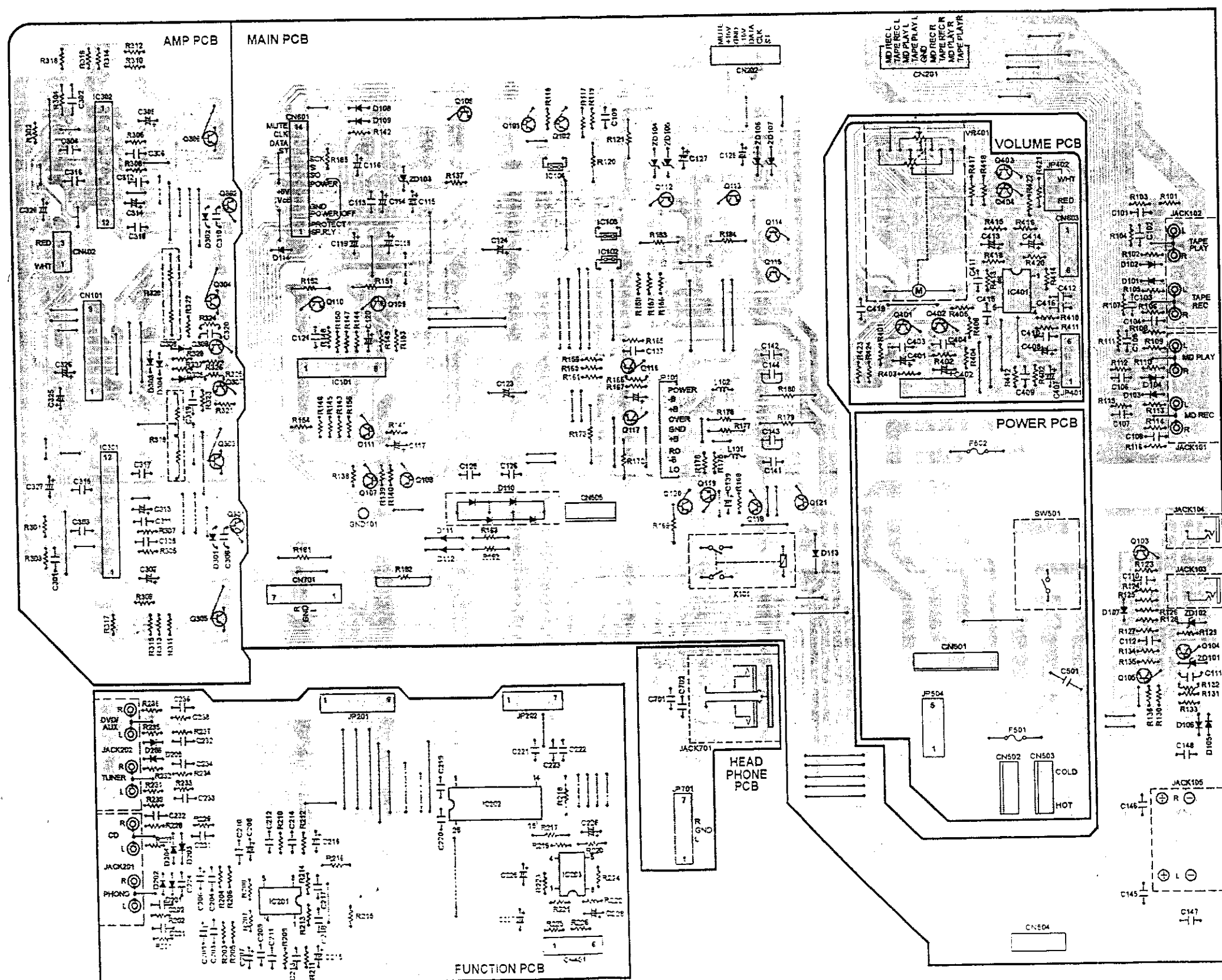
AMPLIFIER SECTION



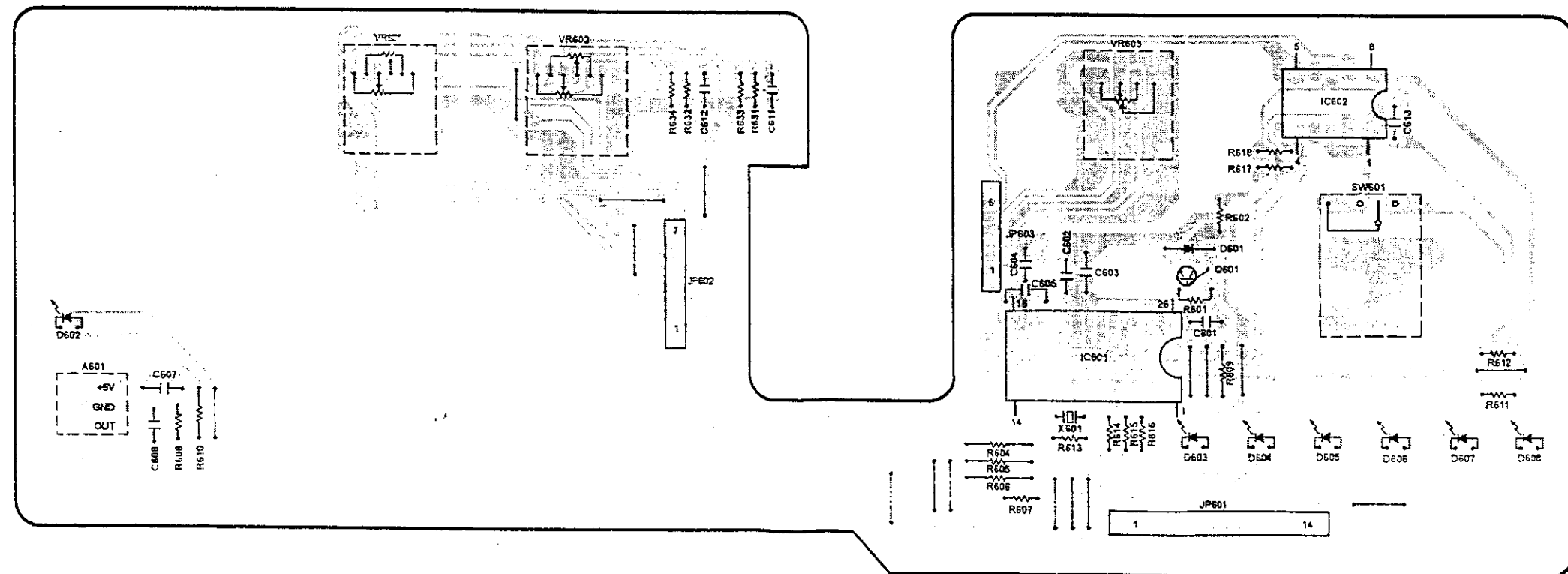
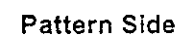


AMPLIFIER SECTION

Pattern Side



Component Side



AMPLIFIER SECTION

NOTE FOR PARTS' LIST

- Part indicated with the mark "⊙" are not always in stock and possibly to take a long period of time for supplying, or in some case supplying of part may be refused.
- When ordering of part, clearly indicate "I" and "II" (i) to avoid mis-supplying.
- Ordering part without stating its part number can not be supplied.
- Part indicated with the mark "★" is not illustrated in the exploded view.
- Not including Carbon Film $\pm 5\%$, 1/4W Type in the P.W.Board parts list. (Refer to the Schematic Diagram for those parts.)

WARNING:

Parts marked with this symbol  have critical characteristics.
Use ONLY replacement parts recommended by the manufacturer.

● Resistors

Ex.: RN 14K 2E 182 G FR
Type Shape Power Resist- Allowable Others
and per-
formance

RD : Carbon	2B : 1/8W	F : $\pm 1\%$	P : Pulse-resistant type
RC : Composition	2E : 1/4W	G : $\pm 2\%$	NL : Low noise type
RS : Metal oxide film	2H : 1/2W	J : $\pm 5\%$	NB : Non-burning type
RW : Winding	3A : 1W	K : $\pm 10\%$	FR : Fuse-resistor
RN : Metal film	3D : 2W	M : $\pm 20\%$	F : Lead wire forming
RK : Metal mixture	3F : 3W		
	3H : 5W		

* Resistance

$\overset{1}{\text{---}} \overset{8}{\text{---}} \overset{2}{\text{---}} \Rightarrow 1800 \text{ ohm} = 1.8 \text{ kohm}$
Indicates number of zeros after effective number.
2-digit effective number.

• Units: ohm

$\overset{1}{\text{---}} \overset{R}{\text{---}} \overset{2}{\text{---}} \Rightarrow 1.2 \text{ ohm}$
1-digit effective number.
2-digit effective number, decimal point indicated by R.

• Units: ohm

● Capacitors

Ex.: CE 04W 1H 2R2 M BP
Type Shape Dielectric Capacity Allowable Others
and per-
formance

CE : Aluminum foil electrolytic	0J : 6.3V	F : $\pm 1\%$	HS : High stability type
CA : Aluminum solid electrolytic	1A : 10V	G : $\pm 2\%$	BP : Non-polar type
CS : Tantalum electrolytic	1C : 16V	J : $\pm 5\%$	HR : Ripple-resistant type
CO : Film	1E : 25V	K : $\pm 10\%$	DL : For charge and discharge
CK : Ceramic	1V : 35V	M : $\pm 20\%$	HF : For assuring high frequency
CC : Ceramic	1H : 50V	Z : $\pm 80\%$	U : UL part
CP : Oil	2A : 100V	-20%	C : CSA part
CM : Mica	2B : 125V	P : $\pm 100\%$	W : UL-CSA type
CF : Metallized	2C : 160V	-0%	F : Lead wire forming
CH : Metallized	2D : 200V	C : $\pm 0.25\text{pF}$	
	2E : 250V	D : $\pm 0.5\text{pF}$	
	2H : 500V	= : Others	
	2J : 630V		

* Capacity (electrolyte only)

$\overset{2}{\text{---}} \overset{2}{\text{---}} \overset{2}{\text{---}} \Rightarrow 2200\mu\text{F}$
Indicates number of zeros after effective number.
2-digit effective number.

• Units: μF

$\overset{2}{\text{---}} \overset{R}{\text{---}} \overset{2}{\text{---}} \Rightarrow 2.2\mu\text{F}$
1-digit effective number.
2-digit effective number, decimal point indicated by R.

• Units: μF

* Capacity (except electrolyte)

$\overset{2}{\text{---}} \overset{2}{\text{---}} \overset{2}{\text{---}} \Rightarrow 2200\text{pF} = 0.0022\mu\text{F}$
(More than 2) — Indicates number of zeros after effective number.
2-digit effective number

• Units: μF

$\overset{2}{\text{---}} \overset{2}{\text{---}} \overset{1}{\text{---}} \Rightarrow 220\text{pF}$
(0 or 1) — Indicates number of zeros after effective number.
2-digit effective number.

• Units: pF

• When the dielectric strength is indicated in AC, "AC" is included after the dielectric strength value.

AMPLIFIER SECTION

PARTS LIST OF P.W.B. UNIT ASS'Y
MAIN UNIT ASS'Y

Ref. No.	Part No.	Part Name	Remarks
SEMICONDUCTORS GROUP			
IC101	263 0646 007	IC M5230L	
△ IC102-104	268 0073 905	IC ICP-N15	
IC201	960 0013 100	IC NJM4565DD	
IC202	960 0080 201	IC KIC9164AN	
IC203	960 0013 100	IC NJM4565DD	
IC301,302	263 0206 007	IC μ PC1225H	
IC401	960 0013 100	IC NJM4565DD	
IC602	263 0476 002	IC LB1639	
Q101	269 0040 009	Transistor DTC144ES	
Q102	269 0093 904	Transistor DTA144ES	
Q103	271 0192 002	Transistor 2SA933S	
Q104,105	273 0303 907	Transistor 2SC1740SR	
Q106	960 0004 902	Transistor KTD2058Y	
Q107	273 0303 907	Transistor 2SC1740SR	
Q108	269 0063 905	Transistor DTA124ES	
Q109,112	960 0004 805	Transistor KTB1366Y	
Q110	960 0004 902	Transistor KTD2058Y	
Q111	273 0303 907	Transistor 2SC1740SR	
Q113	960 0004 902	Transistor KTD2058Y	
Q114	269 0040 009	Transistor DTC144ES	
Q115	269 0093 904	Transistor DTA144ES	
Q116	271 0192 002	Transistor 2SA933S	
Q117,118	273 0303 907	Transistor 2SC1740SR	
Q119	271 0192 002	Transistor 2SA933S	
Q120	273 0303 907	Transistor 2SC1740SR	
Q121	269 0020 906	Transistor DTC114ES	
Q301,302	273 0388 906	Transistor 2SC1740SE	
△ Q303,304	960 0000 304	Transistor 2SC4467P	
△ Q305,306	960 0000 207	Transistor 2SA1694P	
Q307,308	273 0207 003	Transistor KSC1845F	
Q401,402	273 0303 907	Transistor 2SC1740SR	
Q403,404	960 0080 308	Transistor KTC2878	
D101-109	960 0031 409	Diode 1SS131	
△ D110	960 0039 508	Diode D3SB20	
D111-113	960 0068 401	Diode 1N4002A	
D114	960 0031 409	Diode 1SS131	
D201-206	960 0031 409	Diode 1SS131	
D301-306	960 0031 409	Diode 1SS131	
D601	960 0031 409	Diode 1SS131	
D602-608	960 0002 001	LED SLR34DC3	

Ref. No.	Part No.	Part Name	Remarks
ZD101-103	9H3 0000 509	Zener diode MTZJ6.2B	
ZD104-107	960 0037 209	Zener diode MTZJ13B	
RESISTORS GROUP			
△ R173	244 0038 009	Metal oxide 560 ohm 1W	RS14B3A561J Europe model
△ R173	244 0040 026	Metal oxide 820 ohm 1W	RS14B3A821J Asia model
△ R179,180	244 2043 937	Metal oxide 10 ohm 1W	RS14B3A100J
△ R181,182	244 0038 009	Metal oxide 560 ohm 1W	RS14B3A561J
△ R319,320	243 2026 032	Cement resistor 0.22 ohm 3W	RW99-3FR22K
CAPACITORS GROUP			
C101-108	253 1191 981	Ceramic 56pF/50V	CK14SL1H560J
C109	254 4260 058	Electrolytic 2.2 μ F/50V	CE04W1H2R2M
C110	HMA 1000 159	Ceramic 100pF/50V	CK14B1H101K
C111,112	253 1194 959	Ceramic 1000pF/50V	CK14B1H102K
C113	AVC 7700 133	Ceramic 0.01 μ F/16V	CK14Y1C103M
C114	254 4254 019	Electrolytic 22 μ F/16V	CE04W1C220M
C115	254 4260 061	Electrolytic 3.3 μ F/50V	CE04W1H3R33M
C116	254 4127 007	Electrolytic 220 μ F/6.3V	CE04W0J221
C117	254 4260 087	Electrolytic 10 μ F/50V	CE04W1H101K
C118,119	254 4256 046	Electrolytic 100 μ F/25V	CE04W1E101M
C120	254 4260 045	Electrolytic 1 μ F/50V	CE04W1H010M
C121	255 1251 940	Mylar film 4700pF/50V	CQ92M1H472J
C123,124	254 4355 002	Electrolytic 6800 μ F/50V	CE68W1H682MDL
△ C125,126	960 9001 100	Ceramic 0.01 μ F/500V	CK45F2H103Z
C127,128	254 4260 087	Electrolytic 10 μ F/50V	CE04W1H101K
C137	AVC 7700 133	Ceramic 0.01 μ F/16V	CK14Y1C103M
C138	254 4260 087	Electrolytic 10 μ F/50V	CE04W1H101K
C139	254 4250 042	Electrolytic 330 μ F/6.3V	CE04W0J331M
C141-144	255 1251 940	Mylar film 0.047 μ F/50V	CQ92M1H473J
C145-148	257 0009 966	Ceramic chip 4700pF/50V	CK73B1H472K
C201,202	253 3617 007	Ceramic chip 39pF/50V	CC45SL1H390J
C203,204	253 1193 976	Ceramic 220pF/50V	CK14B1H221K
C205,206	254 4260 087	Electrolytic 10 μ F/50V	CE04W1H101K
C207,208	254 4252 037	Electrolytic 100 μ F/10V	CE04W1A101M
C209,210	253 1194 959	Ceramic 1000pF/50V	CK14B1H102K
C211,212	255 4223 933	Mylar film 0.012 μ F/50V	CQ92M1H123J
C213,214	255 4222 963	Mylar film 3300pF/50V	CQ92M1H332J
C215,216	254 4260 058	Electrolytic 2.2 μ F/50V	CE04W1H2R2M
C217-220	AVC 7700 133	Ceramic 0.01 μ F/16V	CK14Y1C103M
C221	253 1194 959	Ceramic 1000pF/50V	CK14B1H102K
C222,223	HMA 1000 159	Ceramic 100pF/50V	CK14B1H101K
C224	AVC 7700 133	Ceramic 0.01 μ F/16V	CK14Y1C103M
C225-228	254 4260 045	Electrolytic 1 μ F/50V	CE04W1H010M
C231-236	257 0004 903	Ceramic chip 56pF/50V	CC73SL1H560J
C301,302	253 1193 976	Ceramic 220pF/50V	CK14B1H221K
C303,304	HMA 1000 159	Ceramic 100pF/50V	CK14B1H101K

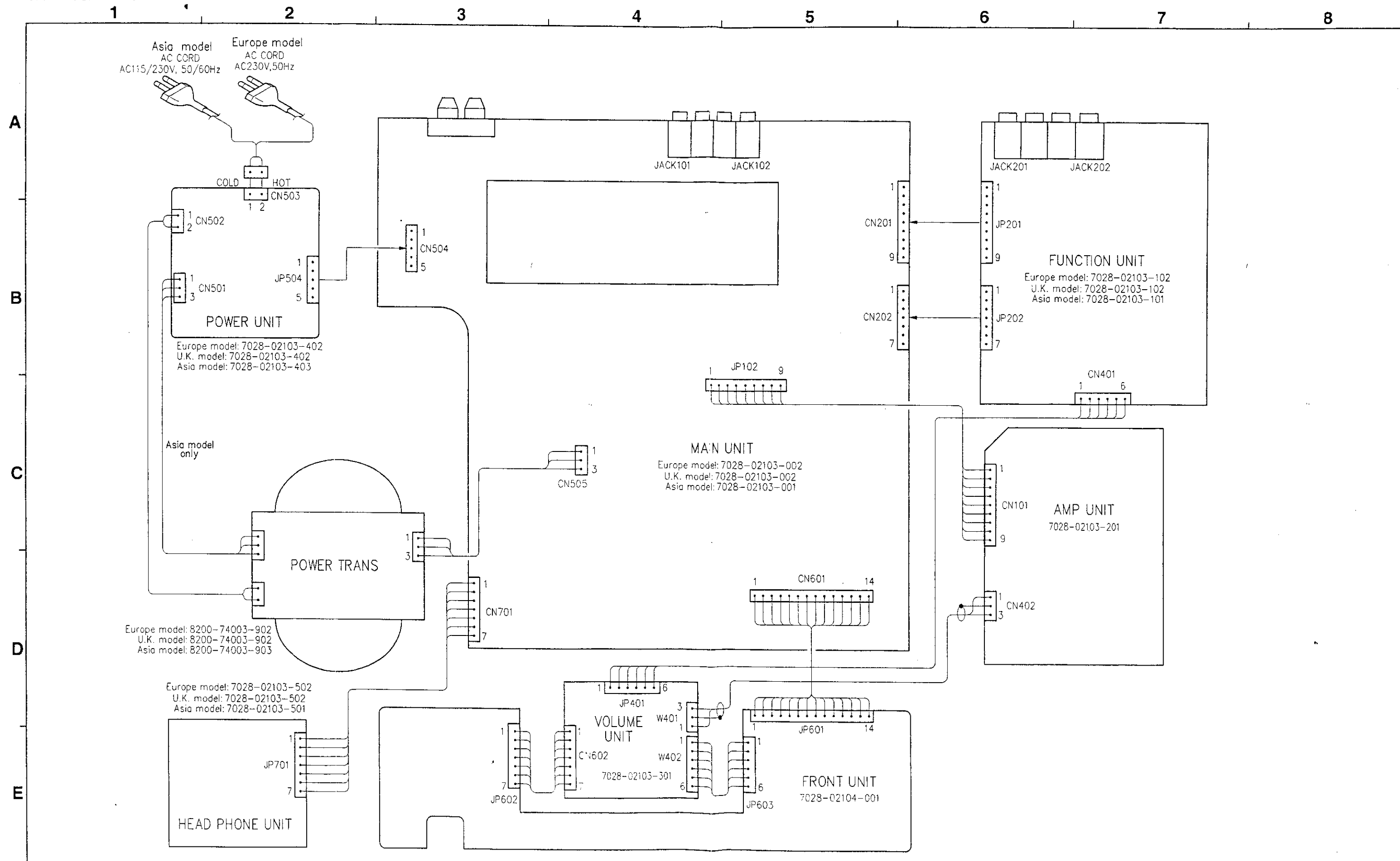
AMPLIFIER SECTION

FRONT P.W.B. UNIT ASS'Y

Ref. No.	Part No.	Part Name	Remarks	Q'ty
C305,306	253 1189 980	Ceramic 4.7pF/50V	CK14SL1H4R7K	
C307,308	254 4252 037	Electrolytic 100μF/10V	CE04W1A101M	
C309,310	257 0012 021	Ceramic 220pF/50V	CK73F1H222Z	
C311,312	253 1179 974	Ceramic 39pF/50V	CK45B1H391K	
C313,314	254 4261 918	Electrolytic 47μF/50V	CE04W1H470M	
△C315,316	253 1126 901	Ceramic 150pF/500V	CK45B2H151K	
C317,318	255 1138 005	Mylar film 0.033μF/50V	CQ92M1H333J	
C319,320	253 1025 002	Ceramic 0.022μF/50V	CK45H1H223Z	
C325-328	254 4260 045	Electrolytic 1μF/50V	CE04W1H010M	
C401,402	254 4260 087	Electrolytic 10μF/50V	CE04W1H101K	
C403,404	255 1121 067	Mylar film 0.022μF/50V	CQ93M1H223J	
C407,408	254 4260 061	Electrolytic 3.3μF/50V	CE04W1H3R3M	
C409,410	253 1193 976	Ceramic 220pF/50V	CK14B1H221K	
C411,412	253 1194 959	Ceramic 1000pF/50V	CK14B1H102K	
C413,414	254 4260 074	Electrolytic 4.7μF/50V	CE04W1H4R7M	
C415,416	HMA 1000 159	Ceramic 100pF/50V	CK14B1H101K	
C419	255 1134 025	Mylar film 0.01μF/50V	CQ92M1H103J	
△C501	253 8001 100	Ceramic 4700pF/250V	CK45F2EAC472Z	
OTHER PARTS GROUP				
CN101	—	9P Connector base	L10135336091	1
CN101	960 0000 605	9P FP cable	L13206091001	1
CN201	—	9P Connector base	L10135336391	1
CN202	—	7P Connector base	L10135336371	1
CN401	—	6P Wire trap	L14152147061	1
CN402	—	3P Connector base	L10252680301	1
△CN502	—	2P Connector base	L10503960201	1
△CN503	—	2P Connector base	L10503960302	1
CN504	—	Connector base	L10205100002	1
CN505	—	3P Connector base	L10439603001	1
CN601	—	14P Wire trap	L14152147141	1
CN602	—	7P Wire trap	L14152147071	1
CN603	—	6P Wire trap	L14152147061	1
CN701	—	7P FP cable	L13206071001	1
△F501	960 0005 707	Fuse 125V 3A	G65030212101	1
GND101	960 0036 909	Earth terminal	379000012000	1
J101-114	—	Junper wire	L40200002002	14
J117-154	—	Junper wire	L40200001002	38
J201-216	—	Junper wire	L40200002002	16
J301-329	—	Junper wire	L40200002002	29
J401-405	—	Junper wire	L40200002002	5
JACK101,102	960 0004 504	4P Pin jack	G60204004500	2

Ref. No.	Part No.	Part Name	Remarks	Q'ty
SEMICONDUCTORS GROUP				
C801	960 0080 900	IC HD404344A		
C501	273 0303 907	Transistor 2SC1740SR		
A601	960 0080 706	Remocon module	E94046020002	
RESISTORS GROUP				
VR401	960 0049 909	Variable resistor 100 kohm	VOLUME	
VR501,602	960 0080 609	Variable resistor 100 kohm	BASS,TRBLE	
VR603	960 0080 502	Variable resistor 200 kohm	BALANCE	
CAPACITORS GROUP				
C801,602	254 4260 045	Electrolytic 1μF/50V	CE04W1H010M	
C803	AVC 7700 133	Ceramic 0.01μF/16V	CK14Y1C103M	
C804	254 4252 037	Electrolytic 100μF/10V	CE04W1A101M	
C805	AVC 7700 133	Ceramic 0.01μF/16V	CK14Y1C103M	
C807	253 1194 917	Ceramic 470pF/50V	CK14B1H471K	
C808	254 4252 037	Electrolytic 100μF/10V	CE04W1A101M	
C811,612	255 1022 001	Mylar film 0.056μF/50V	CQ92M1H563K	
C813	254 4260 087	Electrolytic 10μF/50V	CE04W1H101K	
C814,702	253 1193 976	Ceramic chip 220pF/50V	CC73SL1H221J	
OTHER PARTS GROUP				
JP501	—	14P cable holder	L11151048141	1
JP501	—	14P Flat cable 130mm	L32113114260	1
JP502	—	7P cable holder	L11151048071	1
JP502	—	7P Flat cable 110mm	L32111107261	1
JP503	—	6P cable holder	L11151048061	1
JP503	—	6P Flat cable 160mm	L32116106260	1
JP701	—	7P cable holder	L11251052070	1
JP701	—	7P Flat cable 100mm (BK)	L32010107241	1
△SW501	960 0080 405	Push switch	G00012200702	1
SW501	960 0080 803	Rotary switch	G12016120001	1
X501	399 0191 903	Ceramic resonator CST4.00MGW	E8304R000001	1
J501-617	—	Junper wire	L40200002002	17

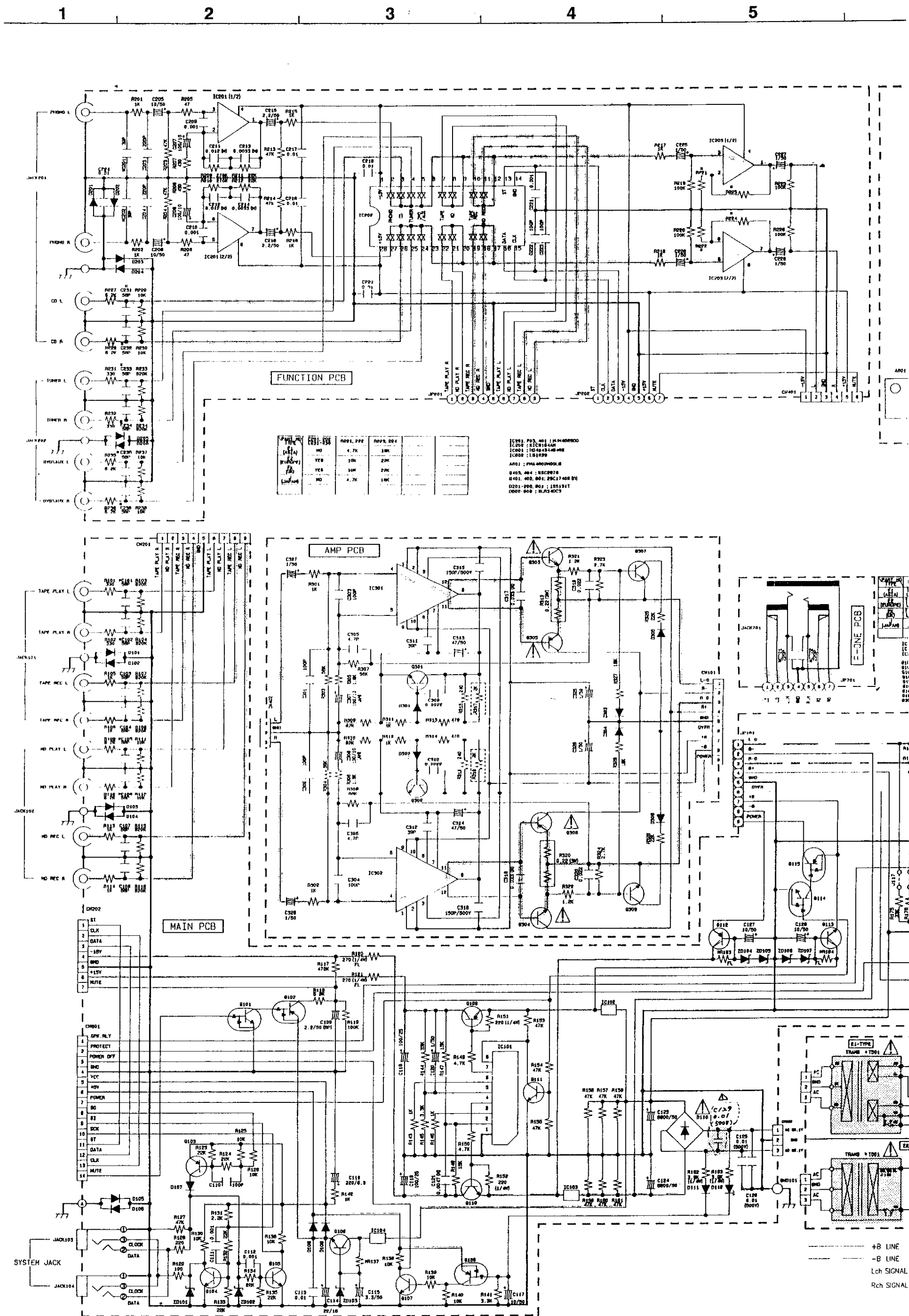
AMPLIFIER SECTION WIRING DIAGRAM



AMPLIFIER SCHEMATIC DIAGRAM

PARTS
PRE-M

Ref. Nr





AMPLIFIER SECTION

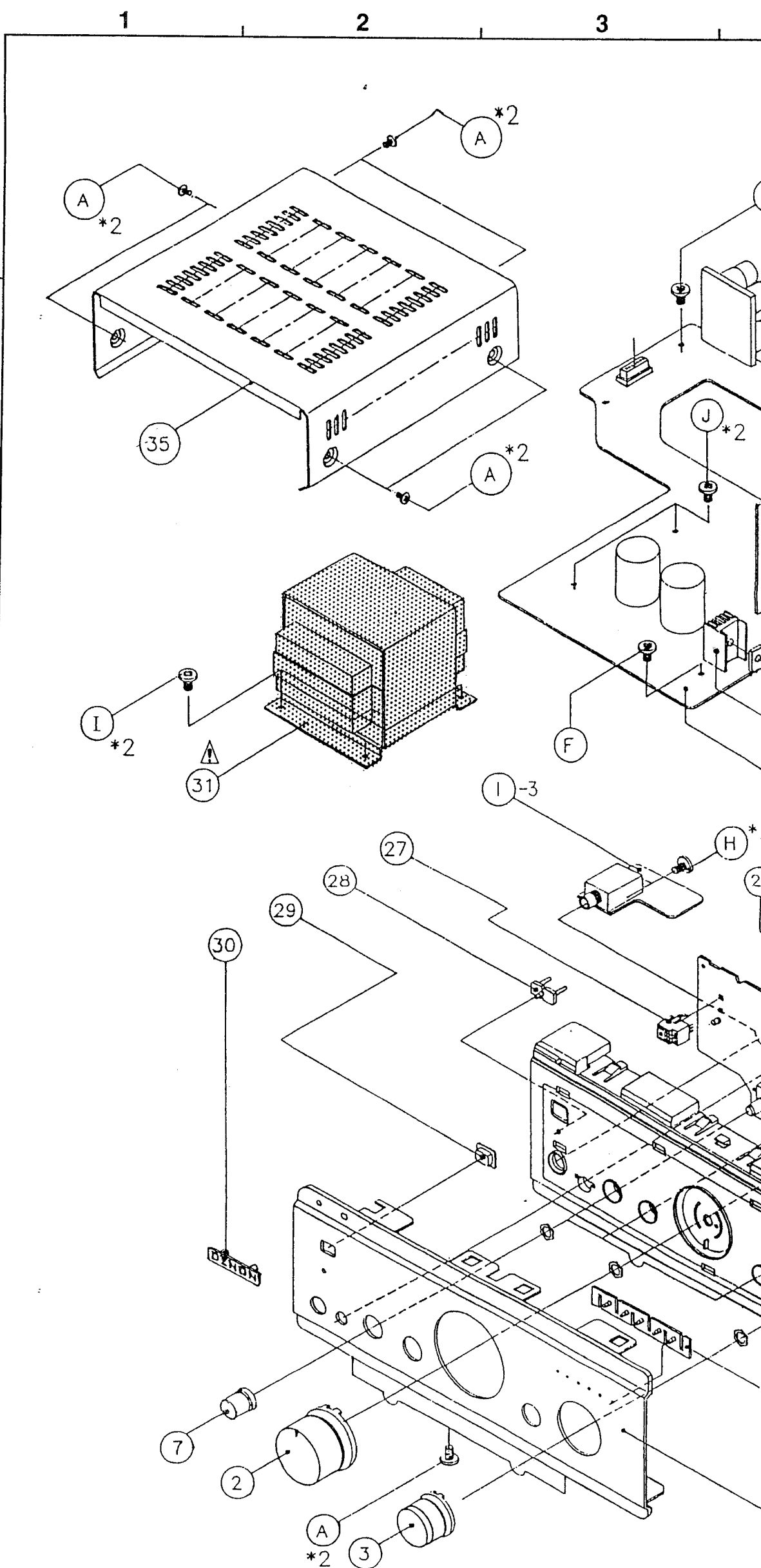
PARTS LIST OF EXPLODED VIEW
PRE-MAIN AMP SECTION(UPA-F88)

EXPLODED VIEW

Ref. No.	Part No.	Part Name	Remarks	Q'ty
1	—	Main P.W.B. unit		1s
1-1	—	Main P.W.B. unit	702802103001 Asia model	(1)
1-1	—	Main P.W.B. unit	702802103002 Europe and U.K.model	(1)
1-2	—	Volume P.W.B. unit	702802103301 Asia model	(1)
1-2	—	Volume P.W.B. unit	702802103302 Europe and U.K.model	(1)
1-3	—	Head phone P.W.B. unit	702802103501 Asia model	(1)
1-3	—	Head phone P.W.B. unit	702802103502 Europe and U.K.model	(1)
1-4	—	Power P.W.B. unit	702802103403 Asia model	(1)
1-4	—	Power P.W.B. unit	702802103402 Europe and U.K.model	(1)
1-5	—	Function P.W.B. unit	702802103101	(1)
1-6	—	AMP P.W.B. unit	702802103201	(1)
1-7	—	Front P.W.B. unit	702802104001	1
2	960 0078 802	Volume knob	508002097101	1
3	960 0078 909	Function knob	508002098101	1
4	960 0078 103	Front panel	306702088801	1
5	960 0078 404	Lens(Function)	371002023301	1
6	960 0078 200	Inner panel	321702014101	1
7	960 0079 005	Control knob	508702099101	3
9	960 0003 505	Foot cushion	405002007501	4
10	960 0003 408	Front foot	400700006101	2
11	960 0077 900	Chassis	320002053601 Europe and U.K.model	1
11	960 0077 913	Chassis	320002053602 Asia model	1
12	960 0003 301	P.W.B. Holder	407000160101	2
13	960 0003 204	Rear foot	400000060101	2
14	960 0078 624	Rear panel	320702006612 Europe and U.K.model	1
14	960 0078 611	Rear panel	320702006611 Asia model	1
Δ 15	960 0078 006	AC Cord	L06100041001	1
Δ 16	960 0003 602	Cord bush	438000018000	1
17	—	Heat sink	212002001801	1
18	—	Bracket P.C.B. unit	401002005601	2
20	960 0000 401	Bracket	401002078601	1
Δ 21	960 0037 403	Voltage selector	G06000100001 Asia model only	1
22	—	Heat sink sub	212000065001	1
23	960 0078 705	Power holder	432002041101	1
25	960 0079 102	Power button	508702100101	1
27	960 0081 106	Holder sensor	432002042101	1
28	960 0078 307	Lens(Power)	371002022301	1
29	960 0078 501	Remocon window	507002040301	1
30	—	DENON Badge	563000042801	1
Δ 31	960 0081 116	Power trans	820074003903 Asia model	1
Δ 31	960 0081 129	Power trans	820074003902 Europe model	1
33	—	Heat sink sub	212002002801	2
35	960 0000 702	Top cover	300002010601	1

SCREWS

A	960 9000 208	Screw 3x8 Bltite BK/BH	B020030083B1	22
B	960 9000 130	Screw 3x8 Bltite BK/FH	B020030083F1	2
C	960 9000 169	Screw 4x8 Cltite ZNY/BH	B020940081B1	2
D	960 9000 143	Screw 3x12 Bltite BK/BH	B020030123B1	3
E	960 9000 101	Tapping screw 3x8 NI/BH	B010330084B1	1
F	960 9000 114	Screw 3x8 Bltite ZNY/BH	B020030081B1	9
G	960 9000 185	Screw 3x14 -Washer	B018230141H1	4
H	960 9000 198	Screw 3x8 -Washer	150000145601	2
I	960 9000 172	Screw 4x8 -Washer	B028940081B1	2
J	960 9000 156	Screw 3x17 Bltite ZNY/BH	B020030171B1	2
K	960 9002 109	Screw 3x6 Bltite ZNY/BH	B020030061B1	4
L	960 9002 109	Screw 3x6 Machin ZNY/BH	B000030061B1 Asia model only	2

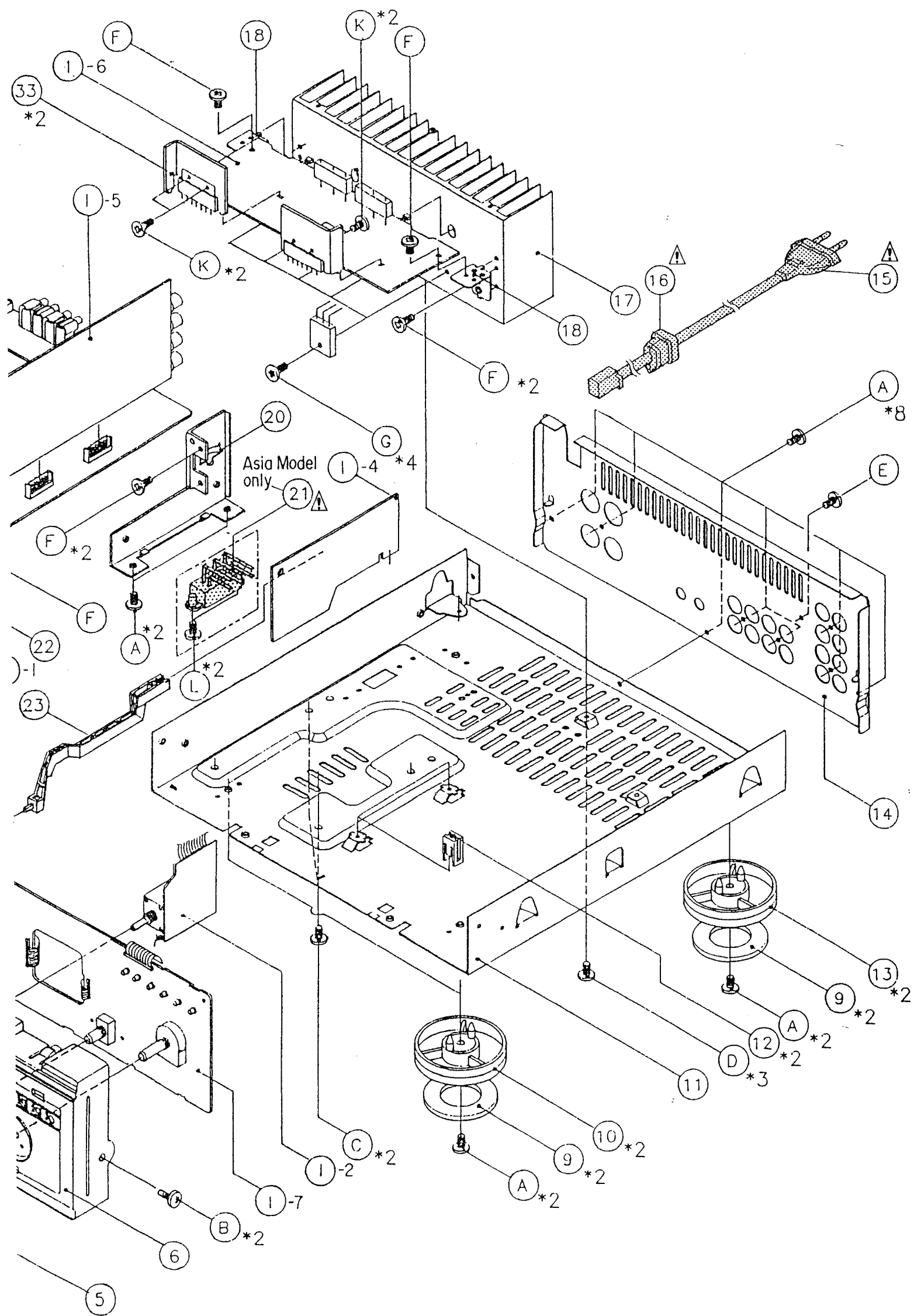


NOTE FOR PARTS LIST

- Part indicated with the mark "⊙" are not always in stock and possibly to take a long period of time for supplying, or some case supplying of part may be refused.
- When ordering of part, clearly indicate "1" and "1" (i) to avoid mis-supplying.
- Ordering part without stating its part number can not be supplied.
- Part indicated with the mark "★" is not illustrated in the exploded view.
- Not including Carbon Film $\pm 5\%$, 1/4W Type in the P.W.Board parts list. (Refer to the Schematic Diagram for those parts)

WARNING:

Parts marked with this symbol Δ have critical characteristics.
Use ONLY replacement parts recommended by the manufacturer.

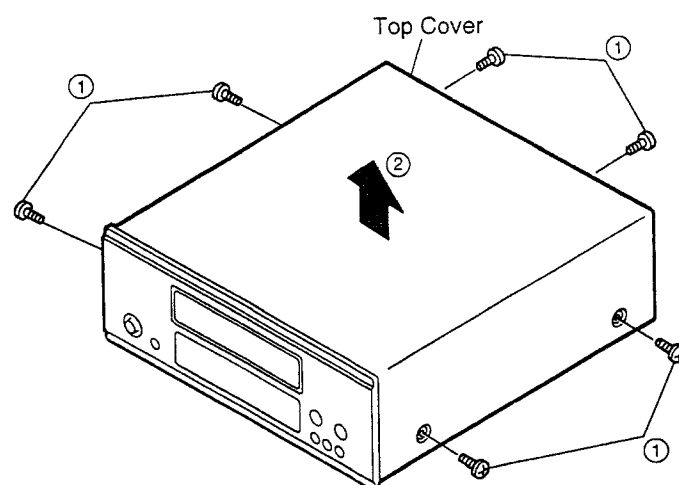


DISASSEMBLY PROCEDURES

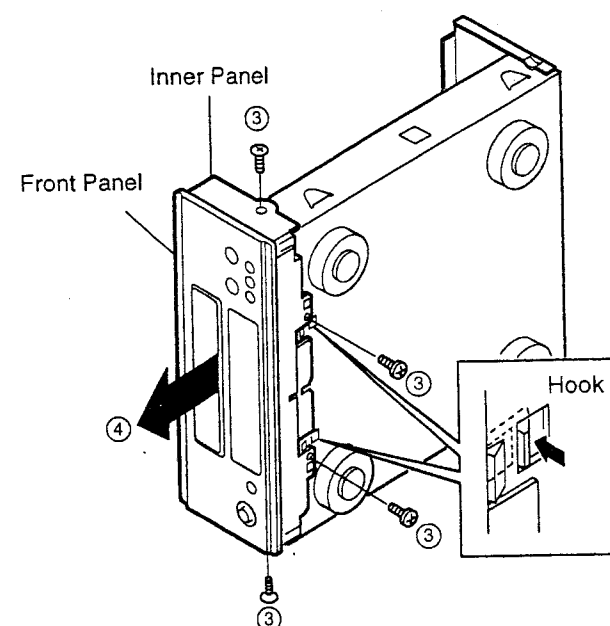
(Assembly is performed in the reverse order.)

1. Top Cover and Front Panel

- ① Remove 6 screws mounting on the Top Cover.
- ② Detach the Top Cover in the arrow direction.

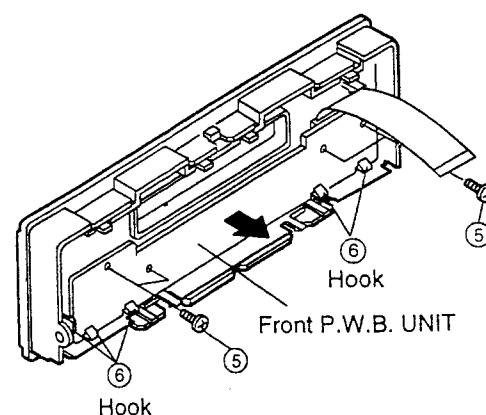


- ③ Remove 2 each screws fastening the Front Panel on the bottom and both side.
- ④ While releasing 2 Hooks of the Inner Panel from the chassis, pull toward arrow direction and detach the Front Panel and the Inner Panel as a whole.



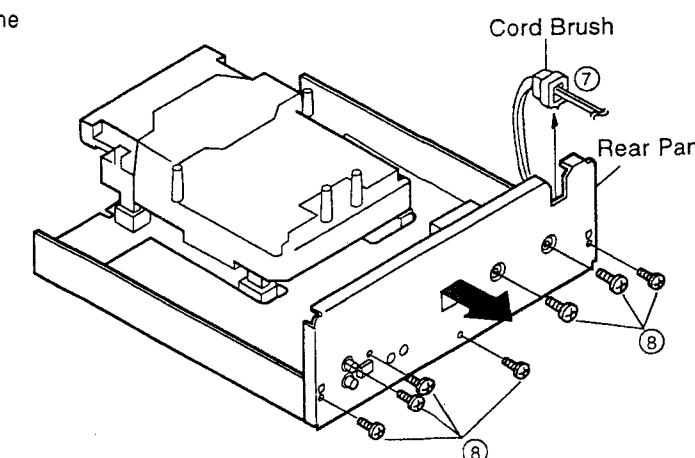
2. Front P.W.B. Unit

- ⑤ Remove 4 screws fastening Front P.W.B. Unit.
- ⑥ Release 5 Hooks and detach the Front P.W.B. Unit in the arrow direction.



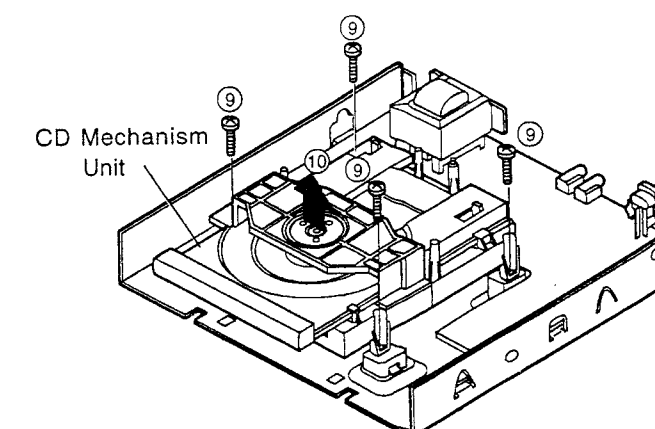
3. Rear Panel

- ⑦ Remove the Cord Brush from the Rear Panel.
- ⑧ Remove 7 screws (Europe model) / 9 screws (Asia model) fixing the Rear Panel, then detach the Rear Panel in the arrow direction.



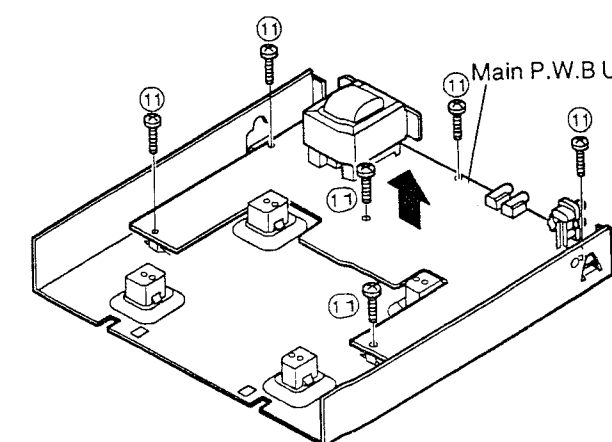
4. CD Mechanism Unit

- ⑨ Remove 4 screws fixing the CD Mechanism Unit.
- ⑩ Detach the CD Mechanism Unit in the arrow direction.



5. Main P.W.B. Unit

- ⑪ Remove 6 screws fastening the Main P.W.B. Unit and detach the Main P.W.B. Unit in the arrow direction.



CD PLAYER SECTION

LASER PICKUP

Terminal Connection

1. PD Connector (Pick-up section)

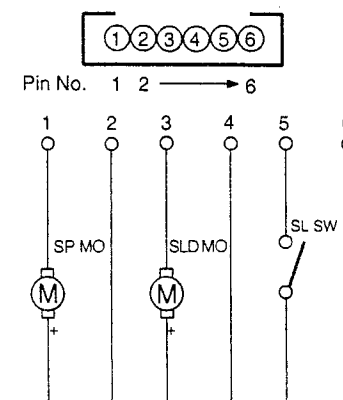
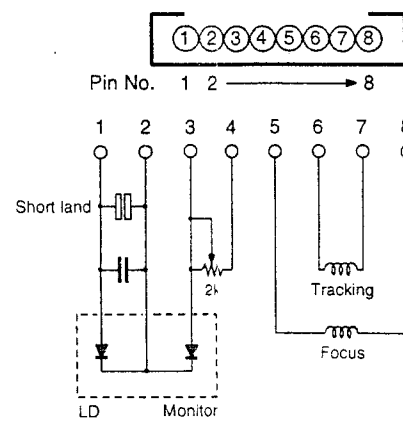
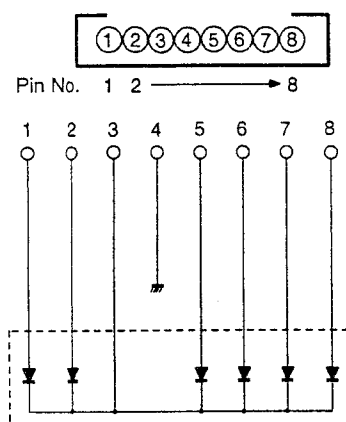
Terminal No.	Contents
1	PD F
2	PD E
3	PD K
4	PD GND
5	PD A
6	PD B
7	PD C
8	PD D

2. LD Actuator Connector (Pick-up section)

Terminal No.	Contents
1	LD
2	LD GND
3	LD Monitor
4	LD Reference level
5	FCS (B) -
6	TRK (B) +
7	TRK (A) -
8	FCS (A) +

3. Motor Connector (Motor unit section)

Terminal No.	Contents
①	Spindle motor -
②	Spindle motor +
③	Sled motor -
④	Sled motor +
⑤	Limit switch
⑥	Limit switch

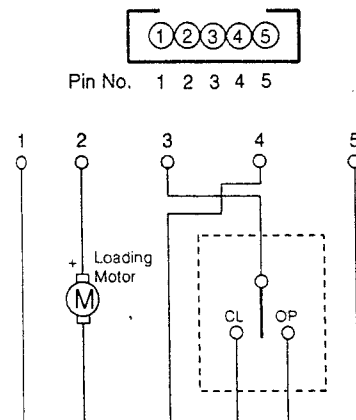


4. Loading Connector (Loading unit section)

Terminal No.	Contents
1	Loading motor -
2	Loading motor +
3	Common terminal
4	Draw out detection terminal
5	Storing detection terminal

List of Using Connector

Name	Maker's Name	Kind	Type	color
PD connector	JST	PH connector	B8B-PH	White
LD actuator connector	JST	PH connector	B8B-PH	Red
Motor connector	JST	PH connector	S6B-PH	White
Loading connector	JST	SAN connector	5P-SAN-PH	White



CAUTION

When replacing Pick-up section, connect red connector cord to PD connector (white) of Pick-up section, and white connector cord to LD connector (red) of Pick-up section.

Description of the Components

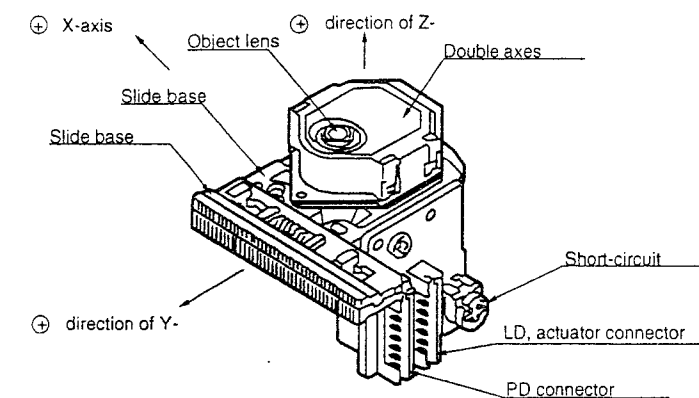


Fig-1

Caution for Handling the Laser Pickup

The laser pick-up KSS-240A is assembled and precisely adjusted using a sophisticated manufacturing process in our plant. Do not disassemble or attempt to readjust it. Please keep the following instructions carefully in handling pick-up.

1. Handle with care

(1) Storage

Do not store the pickup in dusty, high-temperature or high-humidity environments.

Be sure to place ⊕ direction of Z-axis up or ⊕ direction of Y-axis down as shown in the Fig-1 during shipment.

(2) Please take care for preventing from shock by falling down or careless handling.

2. Laser Diode (LD)

(1) Protect your eyes

The laser beam may damage the human eye, since the intensity of the focused spot may reach $7 \times 10^3 \text{ W/cm}^2$ even if the intensity at the objective lens is $400 \mu\text{W}$ maximum. As the light beam spreads after focused through the objective lens, it does not effect you in the place as far as more than 30 cms. However, do not look at the laser light beam either through the objective lens directly nor another lens or a mirror.

(2) Poison of As

Since the LD chip contains As (Arsenic), as GaAs + GaAlAs, as known as the poison, although the poison is relatively weak, in comparing with others, e.g. As_2O_3 , AsCl_3 etc., and the amount is small, avoid putting the chip in acid or an alkali solution, heating it over 200°C or putting it into your mouth.

(3) Avoid surge current or electrostatic discharge

The LD may be damaged or deteriorated by its own strong light if a large current is supplied to it, even if only a short pulse.

Make sure that there is no surge current in the LD driving circuit by switches or else. Be careful to handle pick-up as it may be damaged in a moment by human electrostatic discharge. The pins of the LD are short-circuited by solder for protection during shipment.

For safety handling of an LD, grounding the human body, measuring equipments and jig is strongly recommended.

And still it is further desirable to make use of mat on the platform and floor for handling the LD.

To open the short-circuit, remove the soldering quickly with a soldering iron whose metal part is grounded.

The temperature of the soldering iron should be less than 320°C (30 W).

3. Double axes

(1) Actuator

The performance of the actuator may be effected if magnetic material is located nearby, since the actuator has a strong magnetic circuit. Do not permit dust to enter through the clearance of the cover.

(2) Cleaning the lens

It may change the specifications by attaching dust or ash on the objective lens. Clean the lens with a cleaning paper dampened with a little water, not pressing lens with so much strength by the cleaning paper.

4. Lubrication

No lubrication is essential in operation.

5. Servo Circuit

As this unit is employed a fully adjusted circuit, never attempt to adjust the control volumes.

Cautions for Operation

(1) APC Circuit

Because the laser diode (LD) differs its optical output greatly by temperature, make the compensation of optical output with a monitor photo diode built in LD.

In order to make monitor photo diode in unified characteristic, the optical output and monitor photo diode relation of VR adopted to pick-up is adjusted the RF output fixed. RF level at the time using a supplied estimate reference circuit becomes 1 Vp-p.

(2) Connection

Connection must be used the specified connector.

If noise source such as microcomputer, etc. exists close to the harness coming from photo diode may deteriorate eye pattern, be paid attention.

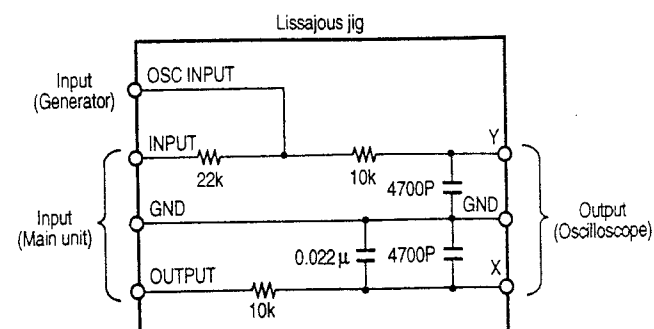
Failure connection in LD, actuator connector may result in laser deterioration. Firmly connect the connectors.

ADJUSTMENTS

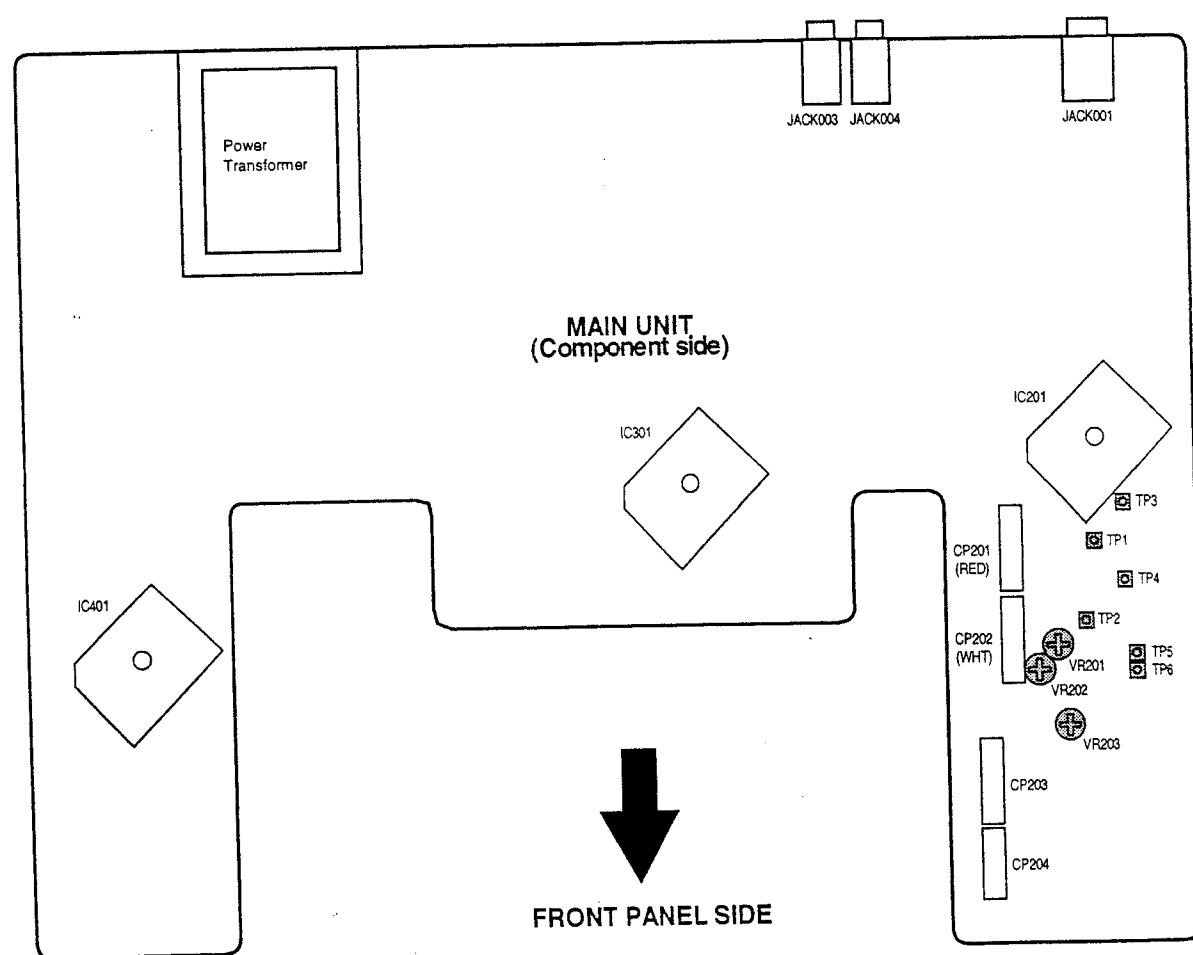
1. Adjustment method

(1) Necessary equipment for adjustment

1. Dual trace oscilloscope
2. Reference disc TOMITA YASUKO (CA-1094 or CA-1094A)
3. Oscillator (10 Hz ~ 10 kHz, 0 ~ 3 Vp-p)
4. Frequency counter (readable no less than 5 kHz)
5. Lissajous jig



(2) Location



TEST POINT

TP1 : 2.5V	TP4 : FEI
TP2 : RF	TP5 : TEO
TP3 : FEO	TP6 : TEI

(3) Preset

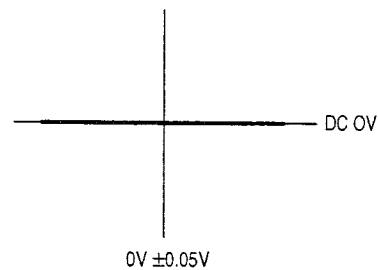
1.	Preset VR201 to 203 as per right figure.	VR201 (Focus offset) 3 O'clock	VR202 (Tracking offset) 3 O'clock	VR203 (Tracking gain) 3 O'clock
2.	Step.	1. Focus offset (refer to page 78) 2. Tracking offset (refer to page 78) 3. Tracking gain (refer to page 78)		

CD PLAYER SECTION

Adjustment Disc: CA-1094 or CA-1094A

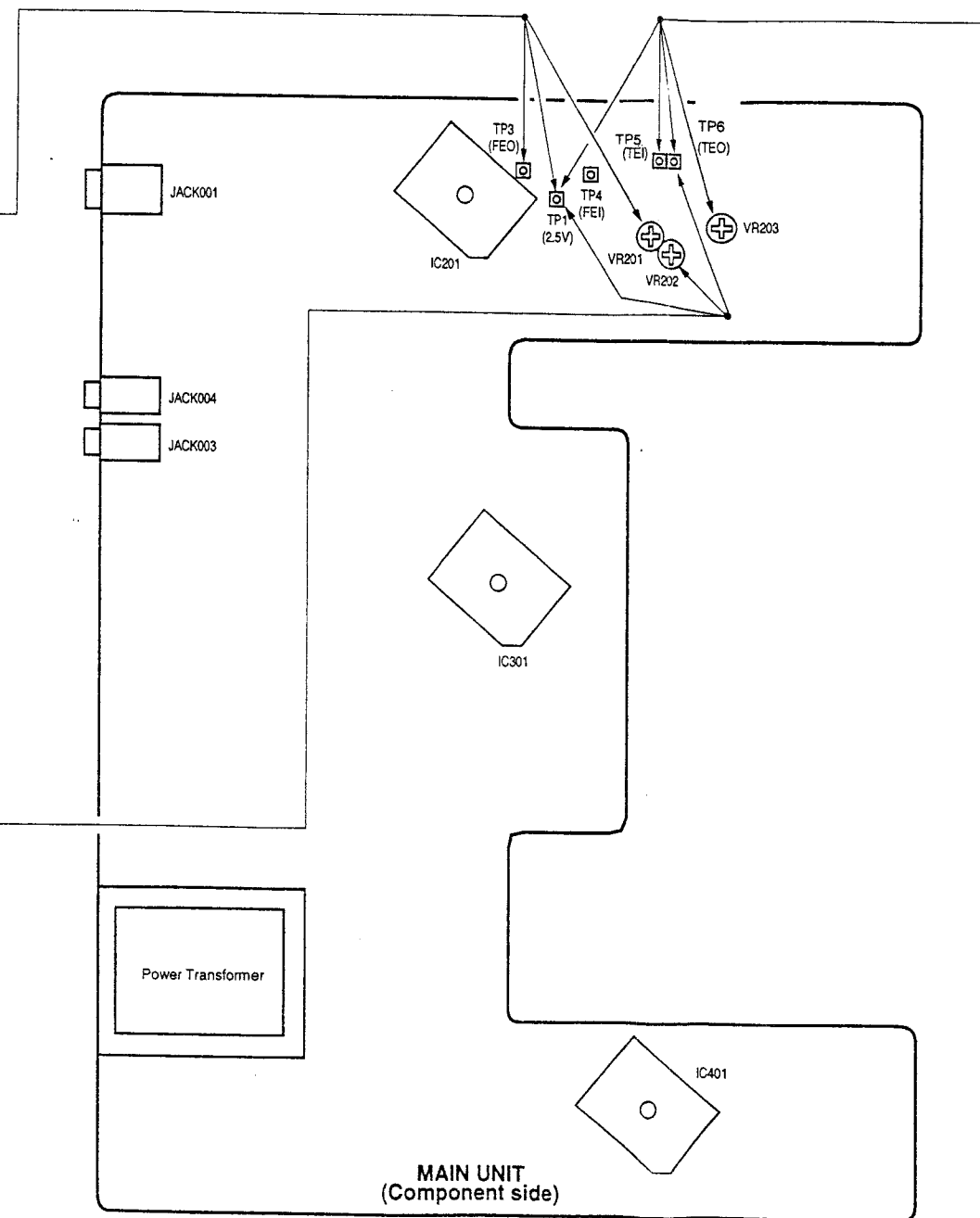
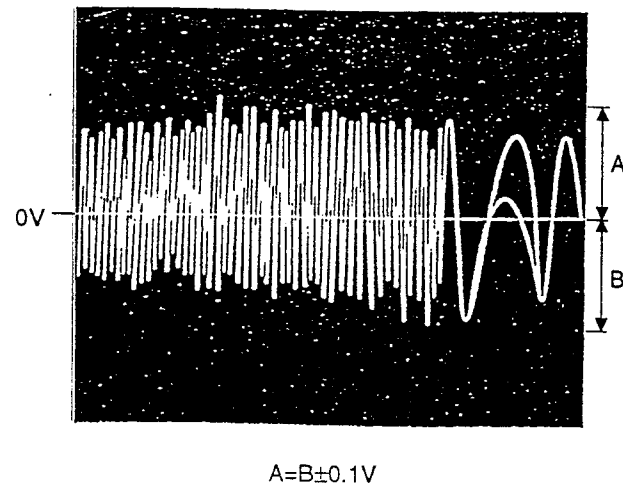
1. Focus offset Adjustment

1. Connect an oscilloscope to TP3 (FEO) and TP1 (2.5 V).
2. Insert the disc and set the unit in stop mode.
3. Adjust VR201 so as a DC voltage value on the scope becomes 0 V.



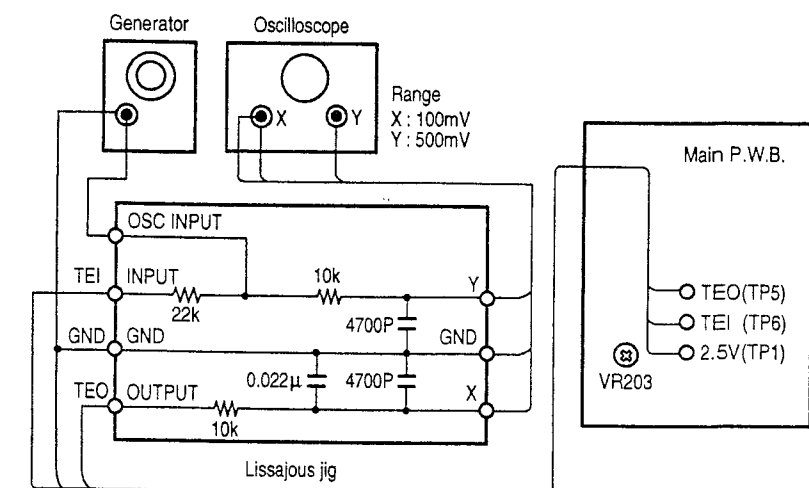
2. Tracking offset Adjustment

1. Connect an oscilloscope to TP5 (TEO) and TP1 (2.5 V).
2. Insert the disc and set the unit in play mode.
3. Set VR203 fully counterclockwise.
4. Adjust VR202 and obtain a waveform on the scope becomes A = B.

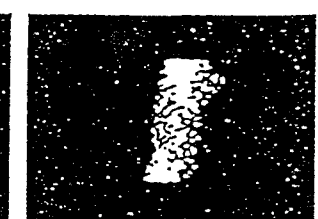
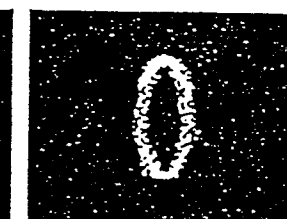
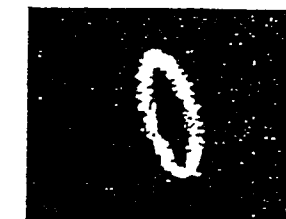


3. Tracking Gain Adjustment

1. Connect INPUT terminal of Lissajous jig and TP6 (TEI).
2. Connect OUTPUT terminal of Lissajous jig and TP5 (TEO).
3. Connect GND terminal of Lissajous jig and TP1 (2.5 V).
4. Connect OSC INPUT terminal of Lissajous jig and output terminal of generator.
5. Connect GND terminal of Lissajous jig and GND terminal of generator.
6. Connect X, Y terminals of Lissajous jig and X, Y terminals of oscilloscope.
7. Connect GND terminal of Lissajous jig and GND terminal of oscilloscope.
8. Adjust the generator so as to obtain a frequency 900 Hz, output 4.0 Vp-p.
9. Load the disc and set the unit in play mode.
10. Adjust VR203 to obtain a waveform on the scope as indicated the following figures.



Tracking Gain Waveform

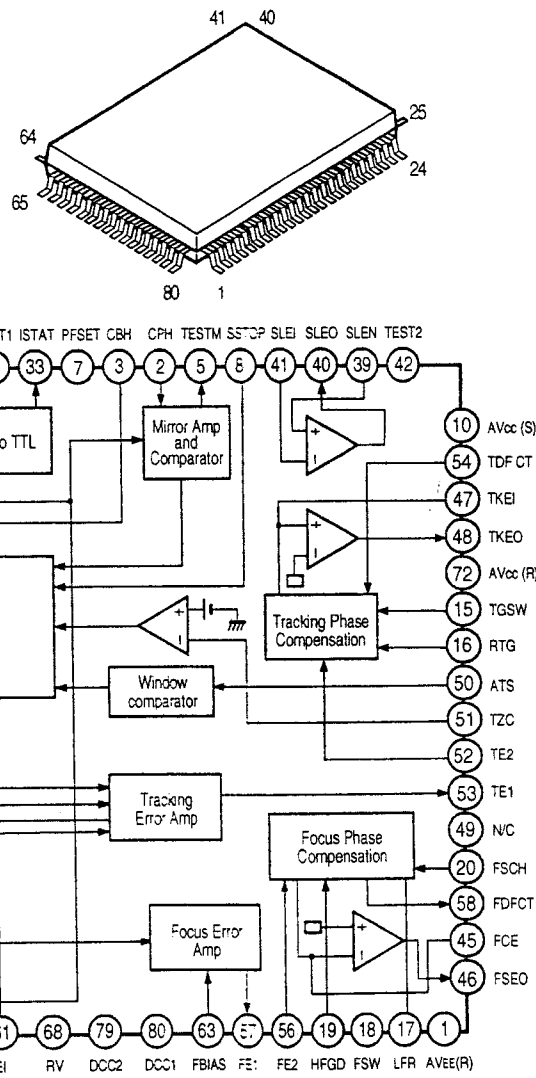


SEMICONDUCTORS

● IC's

KA9220B

(IC201) Linear Integrated Circuit

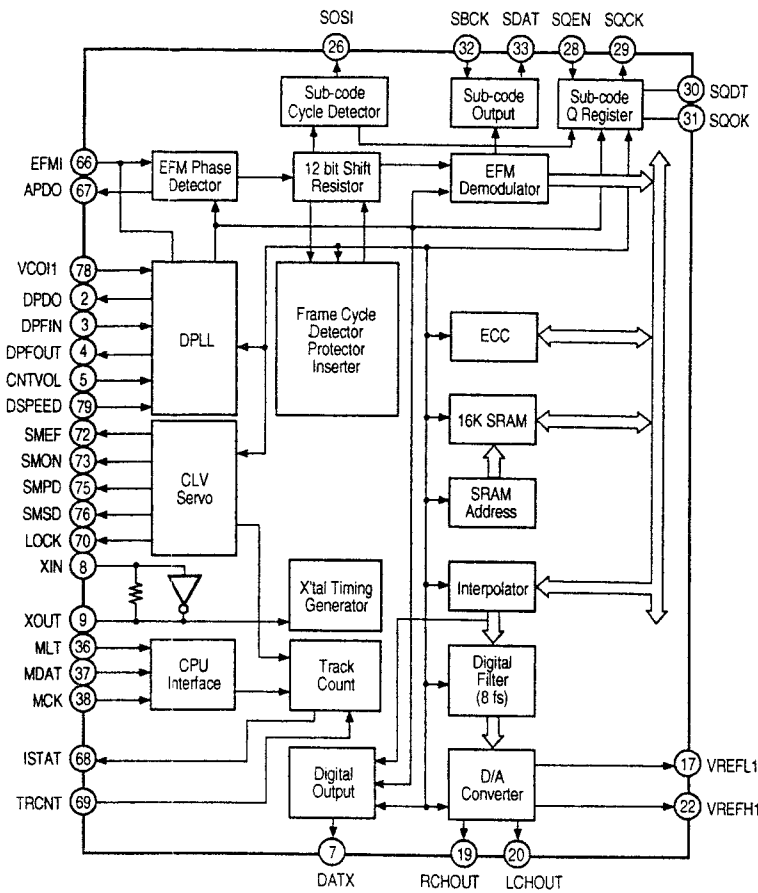
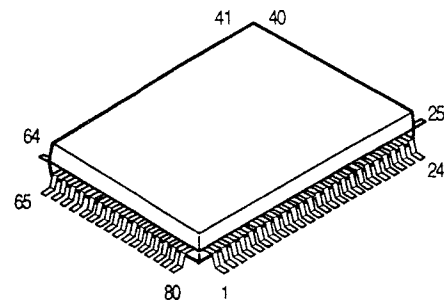


KA9220 Terminal Function

Pin No.	Terminal Name	Function
1	AVEE(R)	Analog - power supply input for RF part.
2	CPH	Capacitor connection pin for mirror hold.
3	CBH	Capacitor connection pin for defect bottom hold.
4	TESTD	Defect test pin.
5	TESTM	Mirror test pin.
6	TEST1	Input pin for test.
7	PFSET	Peak frequency set pin and CLVLPF cut-off frequency set pin for focus, tracking compensation.
8	SSTOP	Checking of pick-up positioning pin that is inside or not.
9	DIRC	Direction control pin of 1 track jump.
10	AVCC(S)	Analog + power supply input for servo part.
11	WDCH	Auto sequencer clock input pin (normal speed = 88.2 kHz, double speed = 176.4 kHz).
12	SMPD	Connection pin of DSPSMPD.
13	SMON	Connection pin of DSPSMON. Spindle servo turns ON at "H".
14	N/C	No connection.
15	TGSW	Gives time constant for changing high frequency tracking gain.
16	RTG	Capacitor connection pin for shifting tracking gain to high frequency.
17	LFR	Capacitor connection pin for lifting lower frequency band of focus servo loop.
18	FSW	Enables to shift high frequency gain of focus servo loop with switch FS3 ON/OFF.
19	HFGD	Reduces high frequency gain with a capacitor connected between Pin18 and Pin 19.
20	FSCH	External time constant pin for generating focus search waveform.

Pin No.	Terminal Name	Function
21	VREGI	Voltage input pin of external VCO regulator.
22	ISSET	Decides peak value of focus search, track jump and SLED kick.
23	VREG	Regulator output pin of 3.5V.
24	FVC	Pin connected to external resistor for VCO free-run frequency adjustment.
25	SMEF	Supplies time constant of CLV SERVO loop external LPF.
26	BPF	Supplies time constant for VCO loop filter.
27	MCK	Clock signal input pin from microcomputer.
28	MLT	Latch signal input pin from microcomputer.
29	MDAT	Data signal input pin from microcomputer.
30	RESET	Reset signal input pin from microcomputer, "L" to reset.
31	LOCK	Pin for overrun preventing function operation at "L".
32	TRCNT	Track counting output pin.
33	ISTAT	Inner status output pin.
34	AVEE(S)	Analog - power supply input pin for servo part.
35	APDI	Phase comparing output of DSP. (PHAS) input pin.
36	F8M	Output pin of analog VCO (normal speed = 8.64 MHz, Double speed = 17.28 MHz).
37	AASC	Auto asymmetric control input pin.
38	EFMO	EFM comparator output pin.
39	SLEN	Input pin of non-inverting SLED SERVO Amp.
40	SLEO	Output pin of SLED SERVO Amp.
41	SLEI	Input pin of inverting SLED SERVO Amp.
42	TEST2	Test input pin for speed mode shifting (normal speed = "H", double speed = "L").
43	SPDI	Input pin of inverting spindle servo Amp.
44	SPDLO	Output pin of spindle servo Amp.
45	FCE	Input pin of inverting focus servo Amp.
46	FSEO	Output pin of focus servo Amp.
47	TKEI	Input pin of non-inverting tracking servo Amp.
48	TKEO	Output pin of tracking servo Amp.
49	N/C	No connection.
50	ATS	Anti-shock input pin.
51	TZC	Tracking zero cross input pin.
52	TE2	Tracking error servo input pin.
53	TE1	Tracking error amp output pin.
54	TDFCT	Capacitor connection pin for tracking servo defect compensation.
55	DVCC(S)	Digital + power supply input pin for servo part.
56	FE2	Focus error servo input pin.
57	FE1	Focus error Amp output pin.
58	FDFCT	Capacitor connection pin for focus servo defect compensation.
59	FOK	Output pin of focus OK comparator.
60	LDON	ON/OFF control pin of laser diode.
61	EI	EI-V Amp feedback input pin.
62	EO	EI-V Amp output pin.
63	FBIAS	Bias pin of non-inverting focus error Amp input.
64	DVEE(S)	Digital - power supply input pin for servo part.
65	RFI	Output signal of RF addition Amp input through capacitor.
66	RFO	Output pin of RF addition Amp.
67	RF-	Input pin of inverting RF addition Amp.
68	RV	Output pin of voltage (Avcc + AVEE)/2
69	CV	Bias input pin of center voltage buffer.
70	LD	Output pin of APC Amp.
71	PD	Input pin of APC Amp.
72	AVCC(R)	Analog + power supply input pin for RF part.
73	N/C	No connection.
74	PD2	Input pin of inverting RFI-V Amp 2.
75	PD1	Input pin of inverting RFI-V Amp 1.
76	F	Input pin of inverting FI-V Amp.
77	E	Input pin of inverting EI-V Amp.
78	P/N	P-sub/N-sub selection of laser diode.
79	DCC2	Output of defect bottom hold input through capacitor.
80	DCC1	Output pin of defect bottom hold.

CD PLAYER SECTION

KS9282
(IC301) CMOS Integrated Circuit

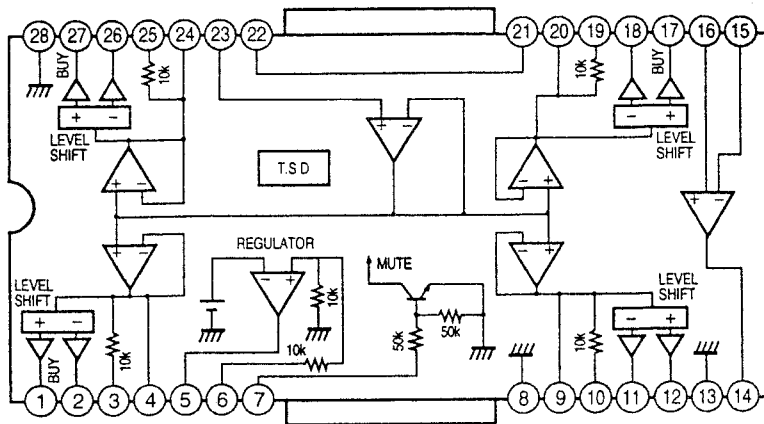
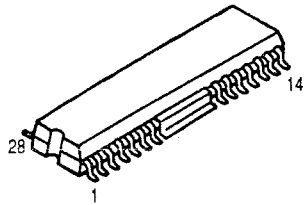
KS9282 Terminal Function

Pin No.	Symbol	I/O	Function
1	AVDD1		Analog Vcc1.
2	DPDO	O	Charge pump output for master PLL.
3	DPFIN	I	Filter input for master PLL.
4	DPFOUT	O	Filter output for master PLL.
5	CNTVOL	I	VCO control voltage for master PLL.
6	AVSS1		Analog GND 1.
7	DATX	O	Digital audio output.
8	XIN	I	X'tal oscillator input.
9	XOUT	O	X'tal oscillator output.
10	WDCH	O	Word clock of 48-bit/SLOT (normal speed = 88.2 kHz, double speed = 176.4 kHz).
11	LRCH	O	Channel clock of 48-bit/SLOT (normal speed = 44.1 kHz, double speed = 88.2 kHz).
12	ADATA	O	Serial audio data output of 48-bit/SLOT (MSB 1st).
13	DVSS1		Digital GND 2.
14	BCK	O	Audio data bit clock for 48-bit/SLOT (normal speed = 2.1168 kHz, double speed = 4.2336 kHz).
15	C2PO	O	C2 pointer for output audio data.
16	VREFL2	I	Input terminal 2 of reference voltage "L" (floating).
17	VREFL1	I	Input terminal 1 of reference voltage "L" (GND connection).
18	AVDD2		Analog Vcc2.
19	RCHOUT	O	R-ch audio output through D/A converter.
20	LCHOUT	O	L-ch audio output through D/A converter.
21	AVSS2		Analog GND 2.
22	VREFH1	I	Input terminal 1 of reference voltage "H" (VDD connection).
23	VREFH2	I	Input terminal 2 of reference voltage "H" (floating).
24	EMPH	O	Emphasis/non-emphasis output ("H" : emphasis).

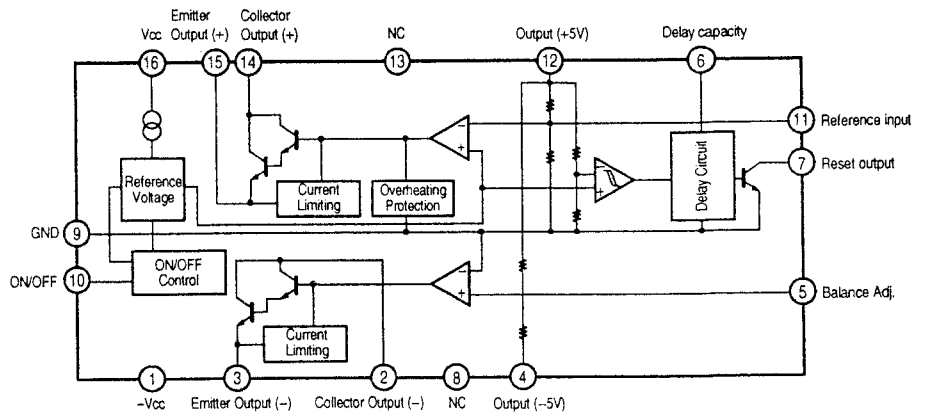
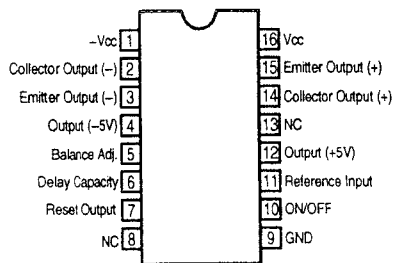
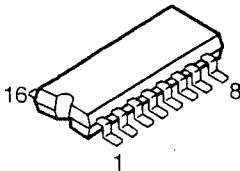
Pin No.	Symbol	I/O	Function
25	LKFS	O	Output of frame sync lock state.
26	SOSI	O	Sub-code sync signal (S0 + S1) output.
27	RESET	I	Resets system at "L".
28	SQEN	I	SQCK I/O control ("L" : inner CK, "H" : external CK).
29	SQCK	I/O	Clock for output sub-code Q data.
30	SQDT	O	Serial output of sub-code Q data.
31	SQOK	O	CRC check result signal output of sub-code Q data.
32	SBCK	I	Clock for output sub-code Q data.
33	SDAT	O	Sub-code serial data output.
34	DVDD1		Digital Vcc1.
35	MUTE	I	Mute control input ("H" : mute ON).
36	MLT	I	Latch signal input from microcomputer.
37	MDAT	I	Serial data input from microcomputer.
38	MCK	I	Serial clock input from microcomputer.
39	DB8	I/O	SRAM data I/O port 8 (MSB).
40	DB7	I/O	SRAM data I/O port 7.
41	DB6	I/O	SRAM data I/O port 6.
42	DB5	I/O	SRAM data I/O port 5.
43	DB4	I/O	SRAM data I/O port 4.
44	DB3	I/O	SRAM data I/O port 3.
45	DB2	I/O	SRAM data I/O port 2.
46	DB1	I/O	SRAM data I/O port 1 (LSB).
47	C1F1	I/O	Monitor output for C1 error compensation (RA1).
48	C1F2	I/O	Monitor output for C1 error compensation (RA2).
49	C2F1	I/O	Monitor output for C2 error compensation (RA3).
50	C2F2	I/O	Monitor output for C2 error compensation (RA4).
51	C2FL	I/O	C2 decoder flag (High : processing C2 code is in state of unable to compensate)(RAS).
52	PBCK	I/O	Output of VCO/2 (normal speed : 4.3218 MHz, double speed : 8.6436 MHz).
53	DVSS2		Digital GND2.
54	FSDW	I/O	Unprotected frame sync (RA7).
55	ULKFS	I/O	Frame sync protect condition (RA8).
56	JIT	I/O	Both displays-overflow and underflow of RAM for ±4 fram jitter margin (RA9).
57	C4M	I/O	Monitor signal only (normal playback : 4.2336 MHz) (RA10).
58	C16M	I/O	16.9344 MHz signal output (RA11).
59	WE	I/O	Test terminal.
60	CS	I/O	Test terminal.
61	SEL1	I	Mode select terminal 1 (H: 33.8688 MHz, L: 16.9344 MHz).
62	SEL2	I	Mode select terminal 2 (H: APLL, L: DPLL).
63	SEL3	I	Mode select terminal 3 (H: CDRAM, L: CDP).
64	SEL4	I	Mode select terminal 4 (L: inner SLAM).
65	TEST	I	Test terminal (L = normal operation mode).
66	EFMI	I	EFM signal input.
67	APDO	O	Charge pump output for analog PLL.
68	ISTAT	O	Inner state output.
69	TRCNT	I	Tracking counting input signal.
70	LOCK	O	LKFS state sampling output signal of PBFR/16 (If LKFS is "H", LOCK is "H"; If LKFS is sampled "L" at least 8 time by PBFR/16, LOCK is "L").
71	PBFR	O	Writing of frame clock (LOCK : 7.35 kHz).
72	SMEF	O	LFP time constant control of spindle servo error.
73	SMON	O	ON/OFF control signal of spindle servo.
74	DVDD2		Digital Vcc2.
75	SMPD	O	Spindle motor drive (rough control at CLV-S mode, phase control at CLV-P mode).
76	SMSD	O	Spindle motor drive (speed control at CLV-S mode).
77	VCOO1	O	VCO output signal (When the state is Locked by PBFR, 8.643 MHz).
78	VCOI1	I	VCO input signal.
79	DSPEED	I	Double speed mode control (H: normal speed, L: double speed).
80	APDO2	O	Analog PLL charge pump output for double speed mode.

CD PLAYER SECTION

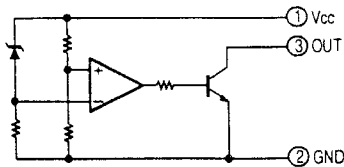
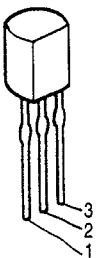
KA9258D (IC202)



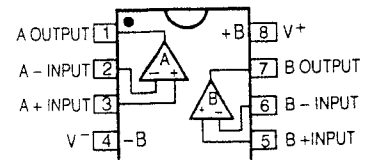
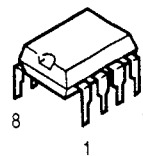
M5290FP (IC103)



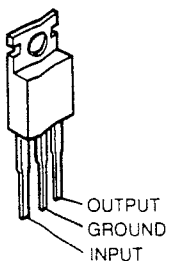
KIA7042P (IC402)



BA4558D (IC203, 501, 502)

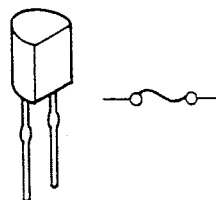


GL7808 (IC104)



● IC PROTECTOR

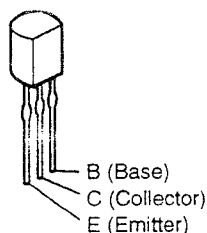
ICP-N15 (IC101, 102)



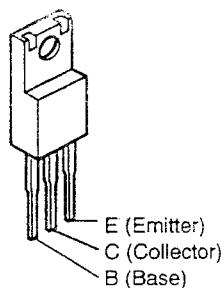
CD PLAYER SECTION

● TRANSISTORS

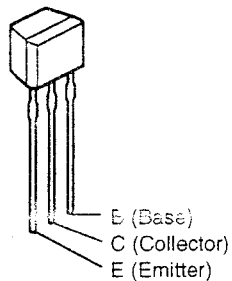
KTA1266 (Y)
KTC3198 (GR)



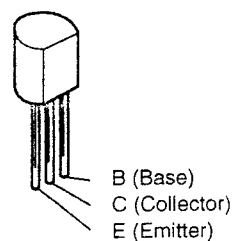
2SB1185 (E/F)



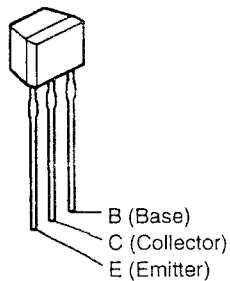
KTA1270 (Y)
KTC3202 (Y)



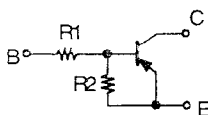
KTA1273 (Y)
KTC3205 (Y)



DTA144WS (PNP)
DTC114ES } (NPN)
DTC143TS
DTC343TS

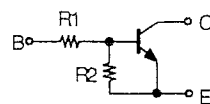


PNP Type
DTA WS Series



	R1	R2
DTA144WS	47 kohm	22 kohm

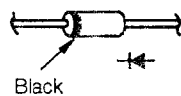
NPN Type
DTC ES/TS Series



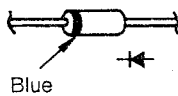
	R1	R2
DTC114ES	10 kohm	10 kohm
DTC143TS	4.7 kohm	—
DTC343TS	4.7 kohm	—

● DIODES

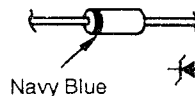
IN4002A



1SS131

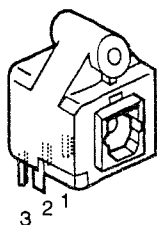


MTZJ5.1B
MTZJ5.6B
MTZJ24B



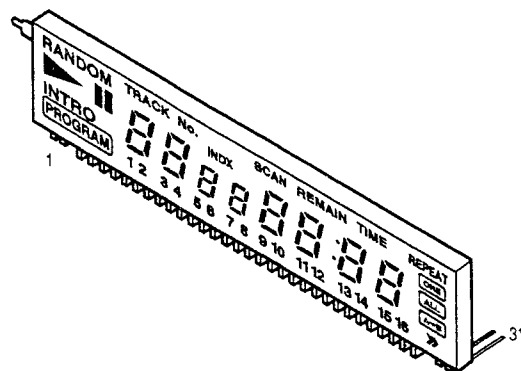
● OPTICAL OUTPUT TERMINAL

GP1F32T (JACK002)



1. GND
2. Vcc
3. Input

● FLUORESCENT DISPLAY TUBE 10BT197GK (FLT701)
(Part No.: DCD 2150 423)



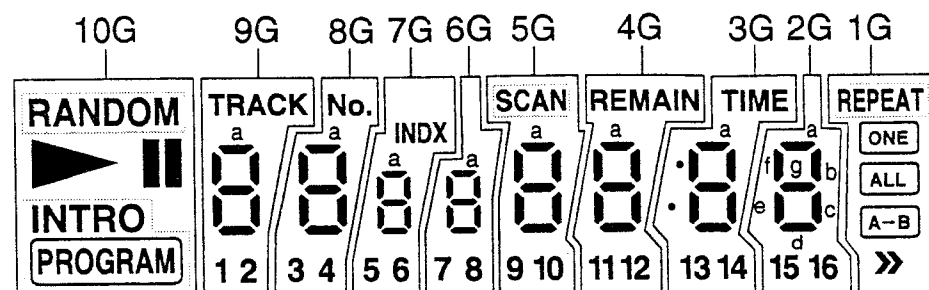
PIN CONNECTION

Pin No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Connection	F1	F1	NP	10G	9G	8G	7G	6G	5G	4G	3G	2G	1G	NC	NC	NC	NC	NC	a	b	c	d	e	f

Pin No.	25	26	27	28	29	30	31
Connection	g	h	i	j	NP	F2	F2

- NOTE
- 1) F1 and F2: Filaments
 - 2) NP: No pin
 - 3) NC: No connection
 - 4) 1G through 11G: Grid

GIRD ASSIGNMENT



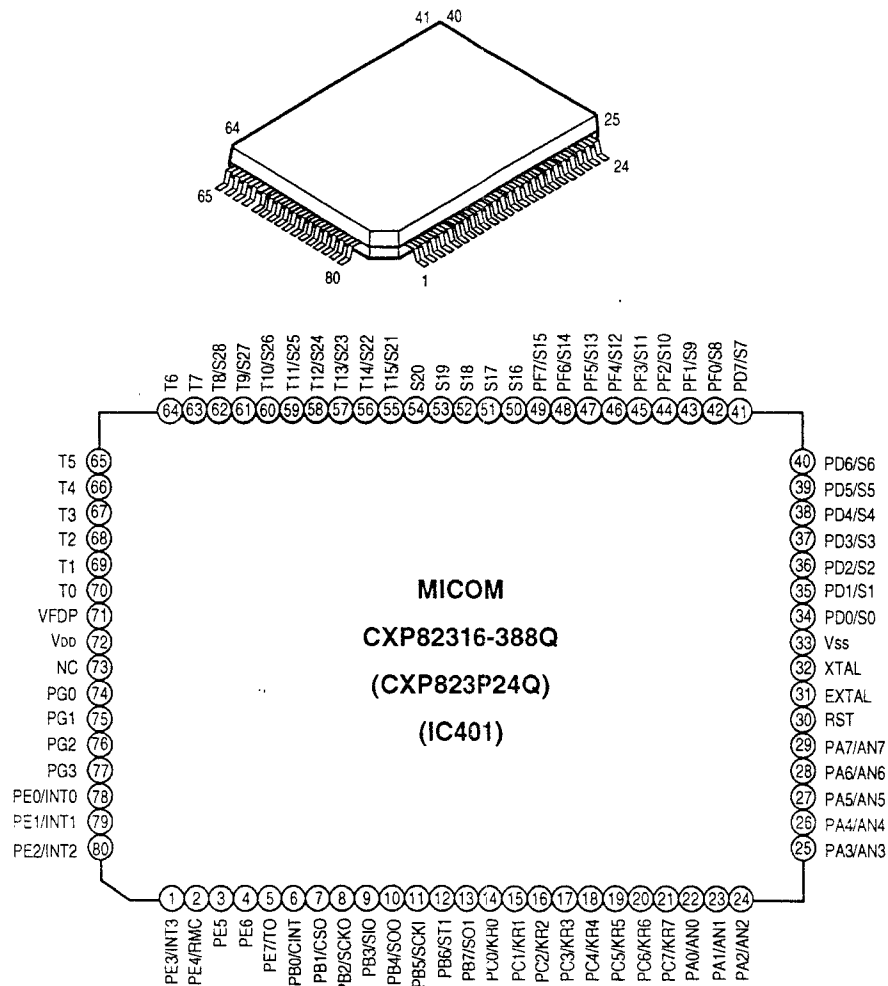
ANODE CONNECTION

	10G	9G	8G	7G	6G	5G	4G	3G	2G	1G
P1	RANDOM	a	a	a	a	a	a	a	a	—
P2	▶	b	b	b	b	b	b	b	b	—
P3		c	c	c	c	c	c	c	c	—
P4	—	d	d	d	d	d	d	d	d	REPEAT
P5	—	e	e	e	e	e	e	e	e	ONE
P6	—	f	f	f	f	f	f	f	f	ALL
P7	—	g	g	g	g	g	g	g	g	A-B
P8	—	TRACK	NO.	INDX	—	SCAN	REMAIN	TIME	—	B
P9	PROGRAM	1	3	5	7	9	11	13	15	—
P10	INTRO	2	4	6	8	10	12	14	16	»

CD PLAYER SECTION

MICROPROCESSOR DOCUMENTATION

CXP82316-388Q
(CXP823P24Q)
(IC401)

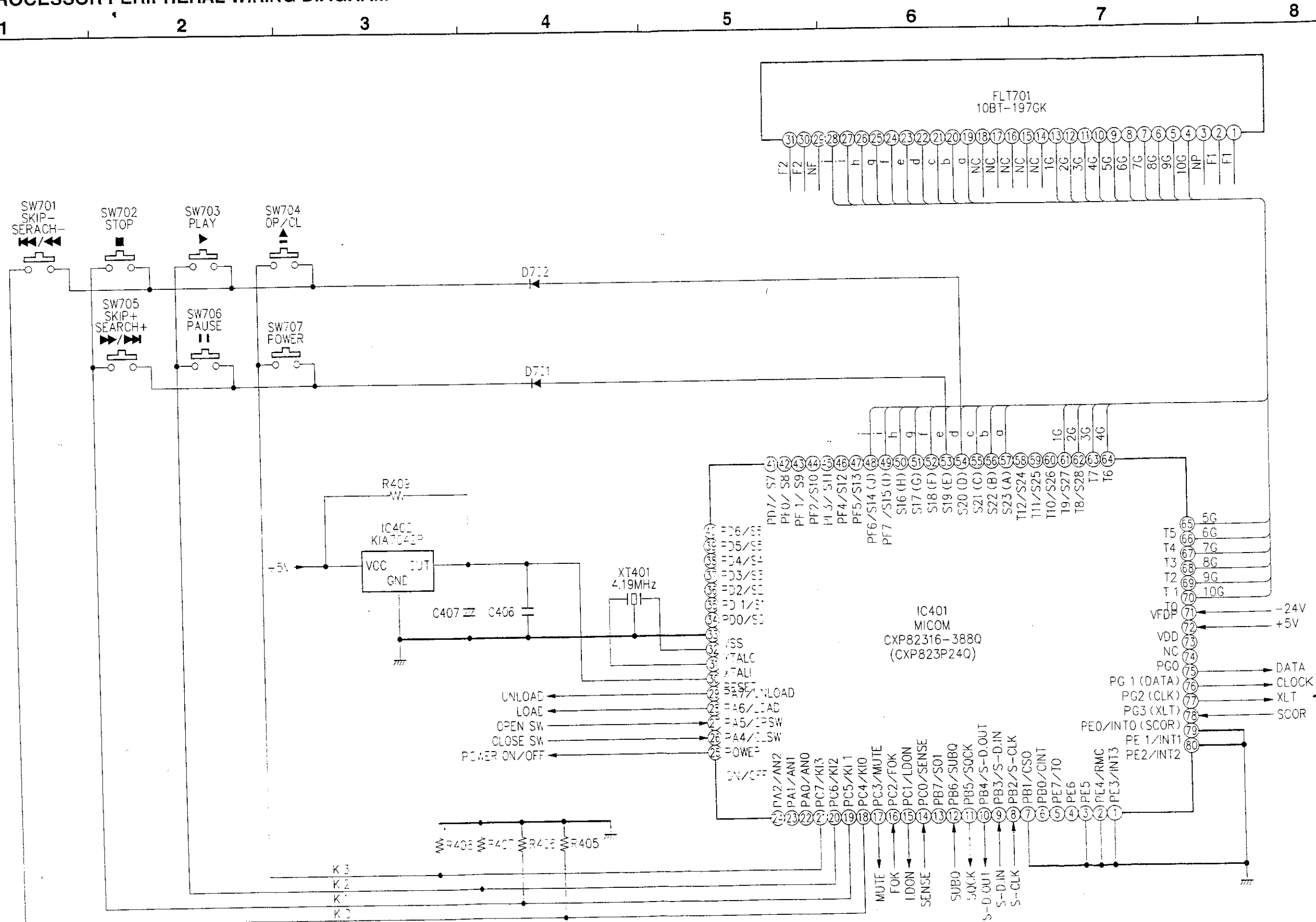


CXP82316-345Q (CXP823P24Q) Terminal Function

Pin No.	Port Name	Function Name	I/O	Ini	ACT	Function
1	PE3/INT3		I	—	—	Connect to GND.
2	PE4/RMC		I	—	—	Connect to GND.
3	PE5		I	—	—	Connect to GND.
4	PE6		O	—	—	Not used.
5	PE7/T0		O	—	—	Not used.
6	PB0/CINT		I/O	—	—	Not used.
7	PB1/CSO		I/O	—	—	Connect to GND.
8	PB2/SCKO	S-CLK	I	H	—	Serial input clock for system computer.
9	PB3/SIO	S-D. IN	I	H	—	Serial input data for system computer.
10	PB4/SO0	S-D. OUT	O	H	—	Serial output data for system computer.
11	PB5/SCKI	SQCK	O	—	—	Clock output signal for sub-code Q reading.
12	PB6/ST1	SUBQ	I	—	—	80-bit sub-code Q input signal.
13	PB7/SO1		O	—	—	Not used.
14	PC0/KR0	SENSE	I	—	H/L	SENSE input signal from CPU.
15	PC1/KR1	LDON	O	H	L	ON/OFF selection signal for CD.
16	PC2/KR2	FOK	I	L	H	Focus OK input signal terminal.
17	PC3/KR3	MUTE	O	H	H	Sound IC mute signal.
18	PC4/KR4	KI0	I	L	H	Key input.
19	PC5/KR5	KI1	I	L	H	Key input.
20	PC6/KR6	KI2	I	L	H	Key input.

Pin No.	Port Name	Function Name	I/O	Ini	ACT	Function
23	PA1/AN1		O	—	—	Not used.
24	PA2/AN2		O	—	—	Not used.
25	PA3/AN3	POWER ON/OFF	O			Power switch.
26	PA4/AN4	CLOSE SW	I	H	L	Close switch input.
27	PA5/AN5	OPEN SW	I	H	L	Open switch input.
28	PA6/AN6	LOAD	O	H	L	Close motor signal.
29	PA7/AN7	UNLOAD	O	H	L	Open motor signal.
30	RST	RESET	—	—	H	Reset input.
31	EXTAL	XTAL IN	I	—	—	Resonator input.
32	XTAL	XTAL OUT	O	—	—	Resonator output.
33	VSS	VSS	O	—	—	GND.
34	PD0/S0		O	—	—	Not used.
35	PD1/S1		O	—	—	Not used.
36	PD2/S2		O	—	—	Not used.
37	PD3/S3		O	—	—	Not used.
38	PD4/S4		O	—	—	Not used.
39	PD5/S5		O	—	—	Not used.
40	PD6/S6		O	—	—	Not used.
41	PD7/S7		O	—	—	Not used.
42	PF0/S8		O	—	—	Not used.
43	PF1/S9		O	—	—	Not used.
44	PF2/S10		O	—	—	Not used.
45	PF3/S11		O	—	—	Not used.
46	PF4/S12		O	—	—	Not used.
47	PF5/S13		O	—	—	Not used.
48	PF6/S14	j	O			FL tube indication segment terminal (j).
49	PF7/S15	i	O			FL tube indication segment terminal (i).
50	S16	h	O			FL tube indication segment terminal (h).
51	S17	g	O			FL tube indication segment terminal (g).
52	S18	f	O			FL tube indication segment terminal (f).
53	S19	e	O			FL tube indication segment terminal (e).
54	S20	d	O			FL tube indication segment terminal (d).
55	T15/S21	c	O			FL tube indication segment terminal (c).
56	T14/S22	b	O			FL tube indication segment terminal (b).
57	T13/S23	a	O			FL tube indication segment terminal (a).
58	T12/S24		O	—	—	Not used.
59	T11/S25		O	—	—	Not used.
60	T10/S26		O	—	—	Not used.
61	T9/S27	1G	O			FL tube indication digit terminal 1G.
62	T8/S28	2G	O			FL tube indication digit terminal 2G.
63	T7	3G	O			FL tube indication digit terminal 3G.
64	T6	4G	O			FL tube indication digit terminal 4G.
65	T5	5G	O			FL tube indication digit terminal 5G.
66	T4	6G	O			FL tube indication digit terminal 6G.
67	T3	7G	O			FL tube indication digit terminal 7G.
68	T2	8G	O			FL tube indication digit terminal 8G.
69	T1	9G	O			FL tube indication digit terminal 9G.
70	T0	10G	O			FL tube indication digit terminal 10G.
71	VFD	VFD				+24V.
72	VDD	VDD				+5V.
73	NC		—	—	—	
74	PG0					
75	PG1	DATA	O	H	H/L	Serial data output signal for DSP.
76	PG2	CLK	O	H	H/L	Serial data transfer clock output signal.
77	PG3	XLT	O	H	L	Serial data latch output signal (latches data at falling).
78	PE0/INT0	SCOR	I	L	H	Sub-code sync signal.
79	PE1/INT1		I	—	—	Connect to GND.
80	PE2/INT2		I	—	—	Connect to GND.

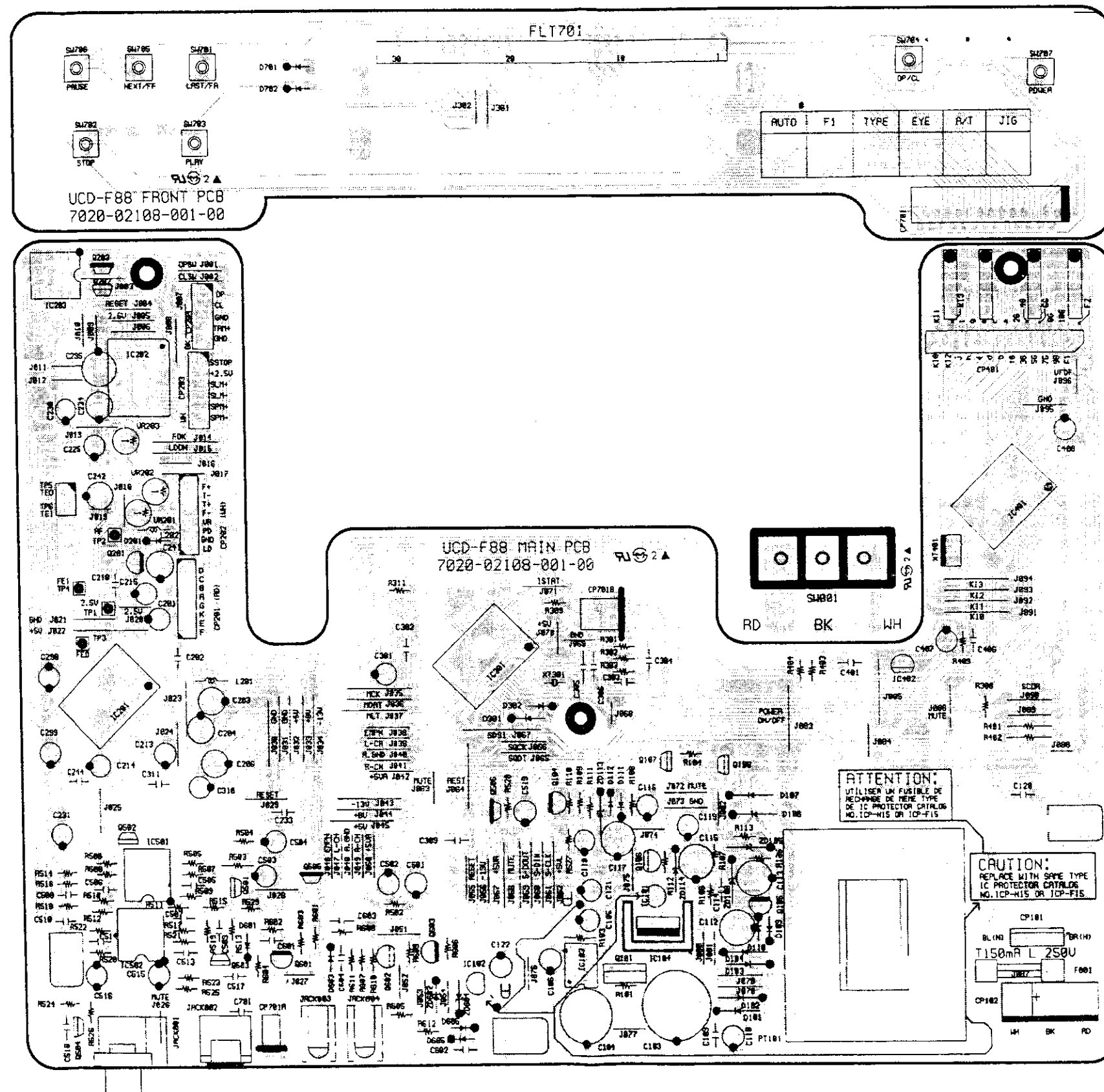
CD PLAYER SECTION



CD PLAYER SECTION
PRINTED WIRING BOARD

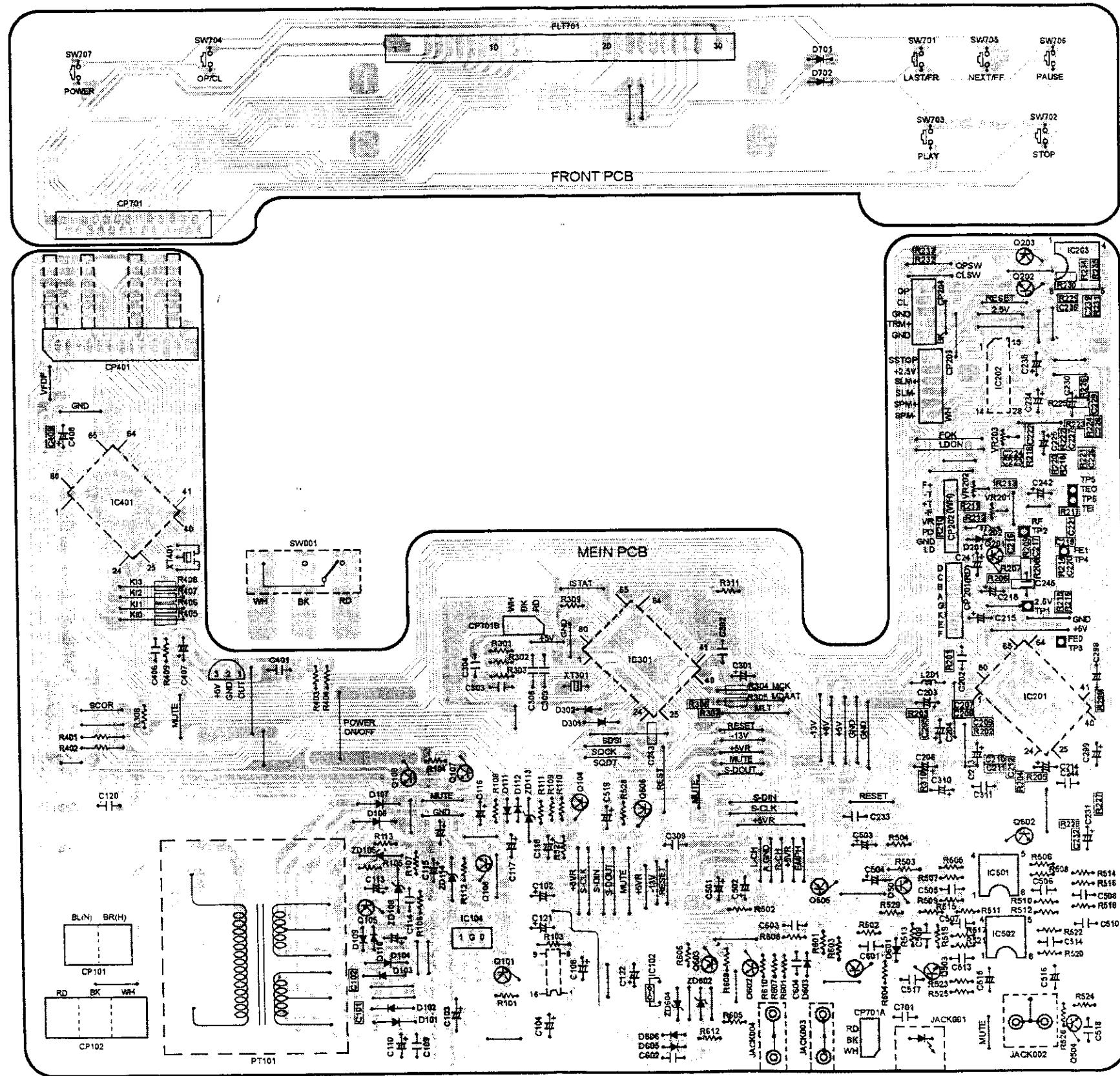
CD UNIT ASS'Y

Component Side



CD PLAYER SECTION

Pattern Side



A

B

C

D

E

CD PLAYER SECTION

NOTE FOR PARTS LIST

- Part indicated with the mark "O" are not always in stock and possibly to take a long period of time for supplying, or in some case supplying of part may be refused.
- When ordering of part, clearly indicate "1" and "1" (i) to avoid mis-supplying.
- Ordering part without stating its part number can not be supplied.
- Part indicated with the mark "★" is not illustrated in the exploded view.
- Not including Carbon Film $\pm 5\%$, 1/4W Type in the P.W.Board parts list. (Refer to the Schematic Diagram for those parts.)

WARNING:

Parts marked with this symbol Δ have critical characteristics.
Use ONLY replacement parts recommended by the manufacturer.

● Resistors

Ex.: RN 14K 2E 182 G FR Others

Type Shape and performance Power Resist-ance Allowable error Others

RD : Carbon	2B : 1/8W	F : $\pm 1\%$	P : Pulse-resistant type
RC : Composition	2E : 1/4W	G : $\pm 2\%$	NL : Low noise type
RS : Metal oxide film	2H : 1/2W	J : $\pm 5\%$	NB : Non-burning type
RW : Winding	3A : 1W	K : $\pm 10\%$	FR : Fuse-resistor
RN : Metal film	3D : 2W	M : $\pm 20\%$	F : Lead wire forming
RK : Metal mixture	3F : 3W		
	3H : 5W		

* Resistance

$\overline{1} \overline{8} \overline{2} \Rightarrow 1800 \text{ ohm} = 1.8 \text{ kohm}$
Indicates number of zeros after effective number.
2-digit effective number.

• Units: ohm

$\overline{1} \overline{R} \overline{2} \Rightarrow 1.2 \text{ ohm}$
1-digit effective number.
2-digit effective number, decimal point indicated by R.

• Units: ohm

● Capacitors

Ex.: CE 04W 1H 2R2 M BP Others

Type Shape and performance Dielectric strength Capacity Allowable error Others

CE : Aluminum foil electrolytic	0J : 6.3V	F : $\pm 1\%$	HS : High stability type
CA : Aluminum solid electrolytic	1A : 10V	G : $\pm 2\%$	BP : Non-polar type
CS : Tantalum electrolytic	1C : 16V	J : $\pm 5\%$	HR : Ripple-resistant type
CO : Film	1E : 25V	K : $\pm 10\%$	DL : For charge and discharge
CK : Ceramic	1V : 35V	M : $\pm 20\%$	HF : For assuring high frequency
CC : Ceramic	1H : 50V	Z : $\pm 80\%$	U : UL part
CP : Oil	2A : 100V	-20%	C : CSA part
CM : Mica	2B : 125V	P : $\pm 100\%$	W : UL-CSA type
CF : Metallized	2C : 160V	-0%	F : Lead wire forming
CH : Metallized	2D : 200V	C : $\pm 0.25\text{pF}$	
	2E : 250V	D : $\pm 0.5\text{pF}$	
	2H : 500V	= : Others	
	2J : 630V		

* Capacity (electrolyte only)

$\overline{2} \overline{2} \overline{2} \Rightarrow 2200\mu\text{F}$
Indicates number of zeros after effective number.
2-digit effective number.

• Units: μF .

$\overline{2} \overline{R} \overline{2} \Rightarrow 2.2\mu\text{F}$
1-digit effective number.
2-digit effective number, decimal point indicated by R.

• Units: μF .

* Capacity (except electrolyte)

$\overline{2} \overline{2} \overline{2} \Rightarrow 2200\text{pF} = 0.0022\mu\text{F}$
(More than 2) — Indicates number of zeros after effective number.
2-digit effective number.

• Units: μF .

$\overline{2} \overline{2} \overline{1} \Rightarrow 220\text{pF}$
(0 or 1) — Indicates number of zeros after effective number.
2-digit effective number.

• Units: pF.

• When the dielectric strength is indicated in AC, "AC" is included after the dielectric strength value.

PARTS LIST OF P.W.B. UNIT ASS'Y
CD PLAYER UNIT ASS'Y

Ref. No.	Part No.	Part Name	Remarks	
SEMICONDUCTORS				
Δ IC101,102	268 0073 905	IC ICP-N15	IC protector	
IC103	960 0031 001	IC M5290FP	Linear offset	
Δ IC104	DCD 2150 416	IC GL7808	Regulator +8V	
IC201	960 0010 200	IC KA9220C	Optical RF servo	
IC202	DCD 2150 406	IC KA9258D	Linear driver	
IC203	930 1002 009	IC BA4558D	Linear ope.amp	
IC301	DCD 2150 454	IC KS9282	Optical display	
IC401	960 0083 402	IC CXP823P24Q/82316-3889	CPU microprocessor	
IC402	DCD 2150 425	IC KIA7042P	Linear offset	
IC501,502	930 1002 009	IC BA4558D	Linear ope.amp	
Q101	272 0083 004	Transistor 2SB1185(E/F)	Built in resistor	
Q104	960 0005 105	Transistor KTA1266(Y)		
Q105	960 0010 404	Transistor KTA1270(Y)		
Q106	DCD 2150 412	Transistor KTC3202(Y)		
Q107,108	269 0020 906	Transistor DTC114ES		
Q201	960 0010 404	Transistor KTA1270(Y)		
Q202	960 0010 705	Transistor KTC3205(Y)		
Q203	960 0010 501	Transistor KTA1273(Y)		
Q501,502	269 0099 908	Transistor DTC143TS		
Q503,504	S87 2990 550	Transistor DTC343TS		
Q505,506	269 0016 907	Transistor DTA144WS		
Q601	960 0005 105	Transistor KTA1266(Y)	Built in resistor	
Q602	960 0010 608	Transistor KTC3198(GR)		
Q603	960 0005 105	Transistor KTA1266(Y)		
Δ D101-104	916 0053 008	Diode 1N4002A	Rectifier	
ZD105	276 0439 906	Zener diode MTZ5.1B	5.1 V	
D106,107	276 0401 002	Diode 1SS131	Switching diode	
ZD108	9H3 0000 410	Zener diode MTZJ24B	24 V	
D109-112	276 0375 002	Diode 1N4148M	Switching diode	
ZD113,114	9H3 0000 251	Zener diode MTZ5.6B	5.6 V	
D201	276 0401 002	Diode 1SS131	Switching diode	
D301,302	276 0401 002	Diode 1SS131		
D601	276 0401 002	Diode 1SS131		
D602	9H3 0000 251	Zener diode MTZ5.6B		
D603	276 0401 002	Diode 1SS131		
D604	9H3 0000 251	Zener diode MTZ5.6B		
D605,606	276 0401 002	Diode 1SS131		
D701,702	276 0401 002	Diode 1SS131		Switching diode
FLT701	960 0083 606	F.L.D. tube 10-BT-197GK		
RESISTORS				
VR201	DCD 2150 408	Semifixed resistor 4.7 kohm	C54647200210 (I)	
VR202	DCD 2150 407	Semifixed resistor 22 kohm	C54622300210 (I)	
VR203	DCD 2150 407	Semifixed resistor 22 kohm	C54622300210 (I)	
J201-205	-	Carbon chip 0ohm 1/8W	RM73B2BORO	
R101	241 2400 911	Carbon film 4.7 kohm 1/6W	RD14B2E472J	
R103-105	241 2400 995	Carbon film 10 kohm 1/6W	RD14B2E103J	
R106	241 2398 955	Carbon film 1 kohm 1/6W	RD14B2E102J	
R107	241 2400 995	Carbon film 10 kohm 1/6W	RD14B2E103J	
R108,109	241 2399 938	Carbon film 2.2 kohm 1/6W	RD14B2E222J	
R110	241 2403 934	Carbon film 100 kohm 1/6W	RD14B2E104J	
R111	241 2401 978	Carbon film 22 kohm 1/6W	RD14B2E223J	
R112	241 2398 955	Carbon film 1 kohm 1/6W	RD14B2E102J	
R113	241 2400 995	Carbon film 10 kohm 1/6W	RD14B2E103J	
R201	247 0007 945	Carbon chip 1 kohm 1/10W	RM73B--102J	
R202	247 0013 984	Carbon chip 470 kohm 1/10W	RM73B--474J	
R203	247 0012 927	Carbon chip 100 kohm 1/10W	RM73B--104J	
R204	247 0014 941	Carbon chip 820 kohm 1/10W	RM73B--824J	
R205	247 0012 969	Carbon chip 150 kohm 1/10W	RM73B--154J	
R206	247 0003 949	Carbon chip 22 ohm 1/10W	RM73B--220J	
R207	247 0009 901	Carbon chip 4.7 kohm 1/10W	RM73B--472J	
R208	247 0010 987	Carbon chip 27 kohm 1/10W	RM73B--273J	
R209	247 0008 928	Carbon chip 2.2 kohm 1/10W	RM73B--222J	
R210	247 0004 980	Carbon chip 82 ohm 1/10W	RM73B--820J	
R211,212	247 0009 985	Carbon chip 10 kohm 1/10W	RM73B--103J	
R213	247 0010 961	Carbon chip 22 kohm 1/10W	RM73B--223J	
R214	247 0009 969	Carbon chip 8.2 kohm 1/10W	RM73B--822J	
R215	2470011 902	Carbon chip 33kohm 1/10W	RM73B--333J	
R216	247 0010 961	Carbon chip 22 kohm 1/10W	RM73B--223J	
R217	247 0007 945	Carbon chip 1 kohm 1/10W	RM73B--102J	
R218	247 0012 969	Carbon chip 150 kohm 1/10W	RM73B--154J	
R219	247 0012 927	Carbon chip 100 kohm 1/10W	RM73B--104J	
R220	247 0011 944	Carbon chip 47 kohm 1/10W	RM73B--473F	
R221	247 0012 901	Carbon chip 82 kohm 1/10W	RM73B--823J	
R222	247 0011 999	Carbon chip 75 kohm 1/10W	RM73B--753J	
R223	247 0010 929	Carbon chip 15 kohm 1/10W	RM73B--153J	
R224	247 0011 960	Carbon chip 56 kohm 1/10W	RM73B--563J	
R225	247 0011 944	Carbon chip 47 kohm 1/10W	RM73B--473F	
R226	247 0012 943	Carbon chip 120 kohm 1/10W	RM73B--124J	
R227	247 0012 927	Carbon chip 100 kohm 1/10W	RM73B--104J	
R228	247 0009 985	Carbon chip 10 kohm 1/10W	RM73B--103J	
R229	247 0012 901	Carbon chip 82 kohm 1/10W	RM73B--823J	
R230	247 0004 922	Carbon chip 47 ohm 1/10W	RM73B--470J	
R231	247 0012 901	Carbon chip 82 kohm 1/10W	RM73B--823J	
R232,233	247 0011 944	Carbon chip 47 kohm 1/10W	RM73B--473F	
R234,235	247 0011 902	Carbon chip 33 kohm 1/10W	RM73B--333J	

CD PLAYER SECTION

Ref. No.	Part No.	Part Name	Remarks	Ref. No.	Part No.	Part Name	Remarks
R236	247 0018 905	Carbon chip 0 ohm 1/10W	RM73B--0R0K	C114	253 1026 001	Ceramic cap. 0.047 μ F/50V	CK45F1H473Z
R298	247 0012 927	Carbon chip 100 kohm 1/10W	RM73B--104J	C115	254 4261 028	Electrolytic 100 μ F/50V	CE04W1H101M
				C116	254 4260 087	Electrolytic 10 μ F/50V	CE04W1H100M
R301	241 2401 994	Carbon film 27 kohm 1/6W	RD14B2E273J(5)	C117	254 4256 059	Electrolytic 220 μ F/25V	CE04W1E221M
R302,303	241 2399 970	Carbon film 3.3 kohm 1/6W	RD14B2E332J(5)	C118	254 4260 087	Electrolytic 10 μ F/50V	CE04W1H100M
R304-306	247 0011 944	Carbon chip 47 kohm 1/10W	RM73B--473F $\pm$ 1%	C119	254 4260 045	Electrolytic 1 μ F/50V	CE04W1H010M
R307	247 0007 945	Carbon chip 1 kohm 1/10W	RM73B--102J	C120	253 1026 001	Ceramic cap. 0.047 μ F/50V	CK45F1H473Z
R308	241 2398 955	Carbon film 1 kohm 1/6W	RD14B2E102J(5)	C121,122	254 4252 037	Electrolytic 100 μ F/10V	CE04W1A101M
R309	241 2401 978	Carbon film 22 kohm 1/6W	RD14B2E223J(5)				
R310	247 0014 967	Carbon chip 1 Mohm 1/10W	RM73B--105J	C201	254 4252 037	Electrolytic 100 μ F/10V	CE04W1A101M
R311	241 2398 955	Carbon film 1 kohm 1/6W	RD14B2E102J(5)	C202	255 1121 083	Film cap. 0.033 μ F/50V	CQ93M1H333J
R312	247 0018 905	Carbon chip 0 ohm 1/10W	RM73B--0R0K	C203,204	254 4252 040	Electrolytic 220 μ F/10V	CE04W1A221M
				C205	257 0014 032	Ceramic chip 0.1 μ F/25V	CK73F1E104Z
R401,402	241 2398 955	Carbon film 1 kohm 1/6W	RD14B2E102J(5)	C206	254 4252 040	Electrolytic 220 μ F/10V	CE04W1A221M
R403,404	241 2402 951	Carbon film 47 kohm 1/6W	RD14B2E473J(5)	C207-209	257 0012 063	Ceramic chip 0.01 μ F/50V	CK73F1H103Z
R405-408	247 0009 985	Carbon chip 10 kohm 1/10W	RM73B--103J	C210-212	257 0014 032	Ceramic chip 0.1 μ F/25V	CK73F1E104Z
R409	241 2400 995	Carbon film 10 kohm 1/6W	RD14B2E103J(5)	C213	254 4260 074	Electrolytic 4.7 μ F/50V	CE04W1H4R7M
				C214	254 4254 022	Electrolytic 33 μ F/16V	CE04W1C330M
R502	241 2060 005	Carbon film 47 ohm 1/4W	RD14B2E470J	C215	254 4252 037	Electrolytic 100 μ F/10V	CE04W1A101M
R503,504	241 2399 938	Carbon film 2.2 kohm 1/6W	RD14B2E222J(5)	C216	257 0012 005	Ceramic chip 1000 pF/50V	CK73F1H102Z
R505,506	241 2404 991	Carbon film 470 kohm 1/6W	RD14B2E474J(5)	C217	257 0016 988	Ceramic chip 30 pF/50V	CC73CH1H300J (Temp.)
R507,508	241 2401 994	Carbon film 27 kohm 1/6W	RD14B2E273J(5)				
R509,510	241 2401 978	Carbon film 22 kohm 1/6W	RD14B2E223J(5)	C218	255 1120 084	Film cap. 4700 pF/50V	CQ93M1H472J
R511,512	241 2399 970	Carbon film 3.3 kohm 1/6W	RD14B2E332J(5)	C219	257 0014 032	Ceramic chip 0.1 μ F/25V	CK73F1E104Z
R513,514	241 2404 991	Carbon film 470 kohm 1/6W	RD14B2E474J(5)	C220	257 0007 900	Ceramic chip 1000 pF/50V	CC73SL1H102J
R515,516	241 2397 998	Carbon film 560 ohm 1/6W	RD14B2E561J(5)	C221	257 0014 032	Ceramic chip 0.1 μ F/25V	CK73F1E104Z
R517,518	241 2398 997	Carbon film 1.5 kohm 1/6W	RD14B2E152J(5)	C222	257 0012 050	Ceramic chip 6800 pF/50V	CK73F1H682Z
R519-522	241 2400 034	Carbon film 5.6 kohm 1/6W	RD14B2E562J(5)	C223	257 0012 021	Ceramic chip 2200 pF/50V	CK73F1H222Z
R523,524	241 2403 934	Carbon film 100 kohm 1/6W	RD14B2E104J(5)	C224	257 0013 004	Ceramic chip 0.047 μ F/50V	CK73F1H473Z
R525-528	241 2398 955	Carbon film 1 kohm 1/6W	RD14B2E102J(5)	C225	254 4260 016	Electrolytic 0.22 μ F/50V	CE04W1HR22M
R529	241 2403 934	Carbon film 100 kohm 1/6W	RD14B2E104J(5)	C226,227	257 0016 917	Ceramic chip 220 pF/50V	CC73CH1H221J (Temp.)
R601	241 2400 995	Carbon film 10 kohm 1/6W	RD14B2E103J(5)	C228	257 0012 089	Ceramic chip 0.022 μ F/50V	CK73F1H223Z
R602,603	241 2401 978	Carbon film 22 kohm 1/6W	RD14B2E223J(5)	C229	257 0013 910	Ceramic chip 0.068 μ F/50V	CK73F1H683Z
R604	241 2402 951	Carbon film 47 kohm 1/6W	RD14B2E473J(5)	C230	254 4260 087	Electrolytic 10 μ F/50V	CE04W1H100M
R605	241 2397 901	Carbon film 220 ohm 1/6W	RD14B2E221J(5)	C231	254 4260 016	Electrolytic 0.22 μ F/50V	CE04W1HR22M
R606	241 2400 995	Carbon film 10 kohm 1/6W	RD14B2E103J(5)	C232	257 0012 063	Ceramic chip 0.01 μ F/50V	CK73F1H103Z
R607,608	241 2401 978	Carbon film 22 kohm 1/6W	RD14B2E223J(5)	C233	253 9030 086	Ceramic cap. 0.022 μ F/25V	CK45=1E223K
R609	241 2400 995	Carbon film 10 kohm 1/6W	RD14B2E103J(5)	C234	254 4254 048	Electrolytic 100 μ F/16V	CE04W1C101M
R610,611	241 2401 978	Carbon film 22 kohm 1/6W	RD14B2E223J(5)	C235	254 4252 066	Electrolytic 470 μ F/10V	CE04W1A471M
R612	241 2396 928	Carbon film 100 ohm 1/6W	RD14B2E101J(5)	C236	257 0012 063	Ceramic chip 0.01 μ F/50V	CK73F1H103Z
				C237	254 4254 048	Electrolytic 100 μ F/16V	CE04W1C101M
				C238	254 4256 046	Electrolytic 100 μ F/25V	CE04W1E101M
				C239	257 0012 063	Ceramic chip 0.01 μ F/50V	CK73F1H103Z
				C241,242	254 4252 040	Electrolytic 220 μ F/10V	CE04W1A221M
				C243	257 0012 063	Ceramic chip 0.01 μ F/50V	CK73F1H103Z
				C244	253 1146 907	Ceramic 0.01 μ F/50V	CK45F1H103Z
				C298	254 3056 014	Electrolytic 1 μ F/50V(Bipolar)	CE04D1H010MBP
				C299	254 4260 016	Electrolytic 0.22 μ F/50V	CE04W1HR22M
				C301	254 4252 037	Electrolytic 100 μ F/10V	CE04W1A101M
				C302	253 1197 914	Ceramic cap. 0.1 μ F/16V	CK14F1C104Z
				C303	255 1122 008	Film cap. 0.047 μ F/50V	CQ93M1H473J

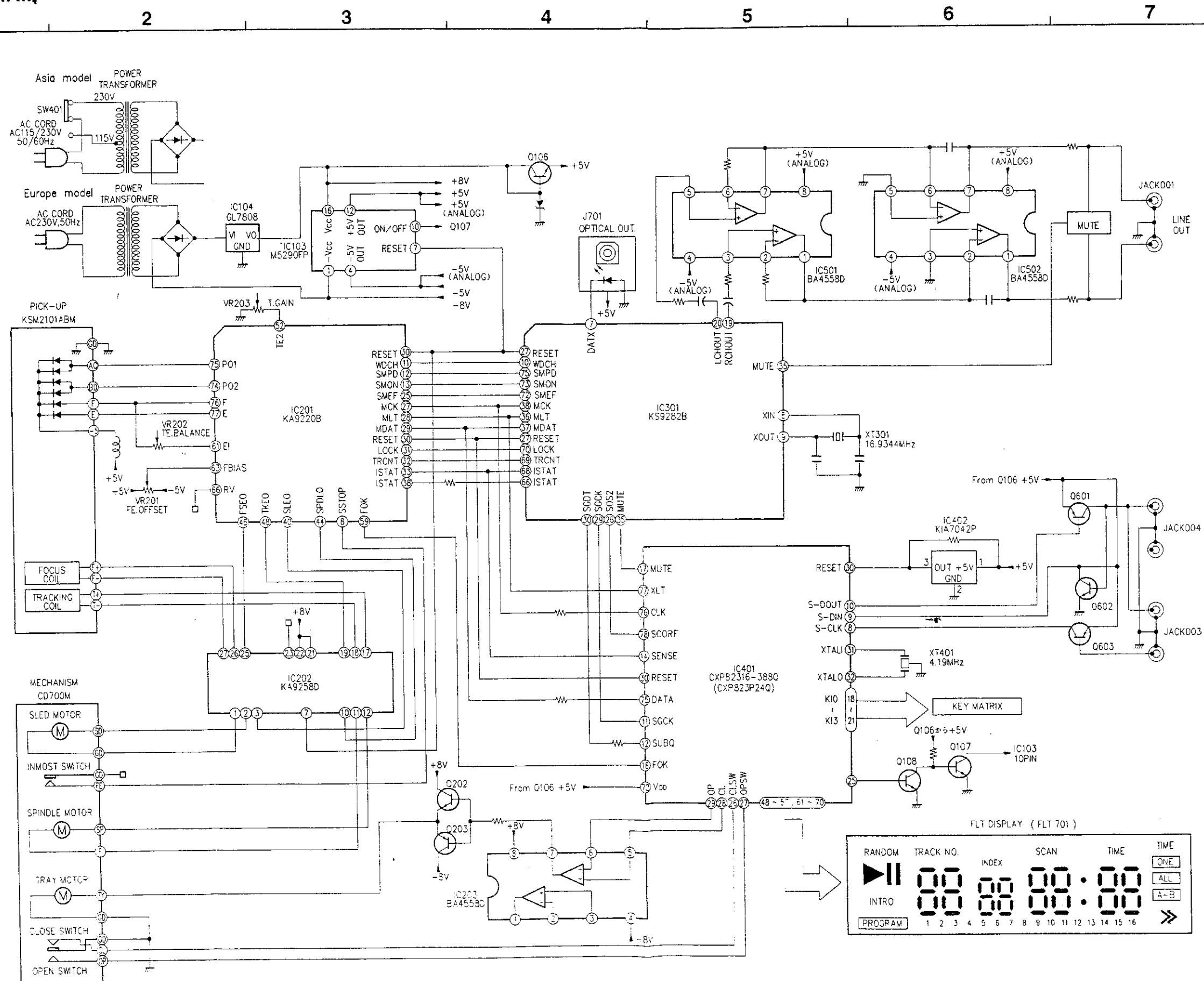
CAPACITORS

C101,102	257 0012 050	Ceramic cap. 6800 pF/50V	CK73F1H682Z
C103	254 4256 091	Electrolytic 2200 μ F/25V	CE04W1E222M
C104	254 4256 088	Electrolytic 1000 μ F/25V	CE04W1E102M
C105	254 4260 061	Electrolytic 3.3 μ F/50V	CE04W1H3R3M
C106	254 4260 045	Electrolytic 1 μ F/50V	CE04W1H010M
C109	253 1174 018	Ceramic cap. 0.01 μ F/16V	CK14Y1C103M
C110	254 4260 045	Electrolytic 1 μ F/50V	CE04W1H010M
C112,113	254 4261 028	Electrolytic 100 μ F/50V	CE04W1H101M

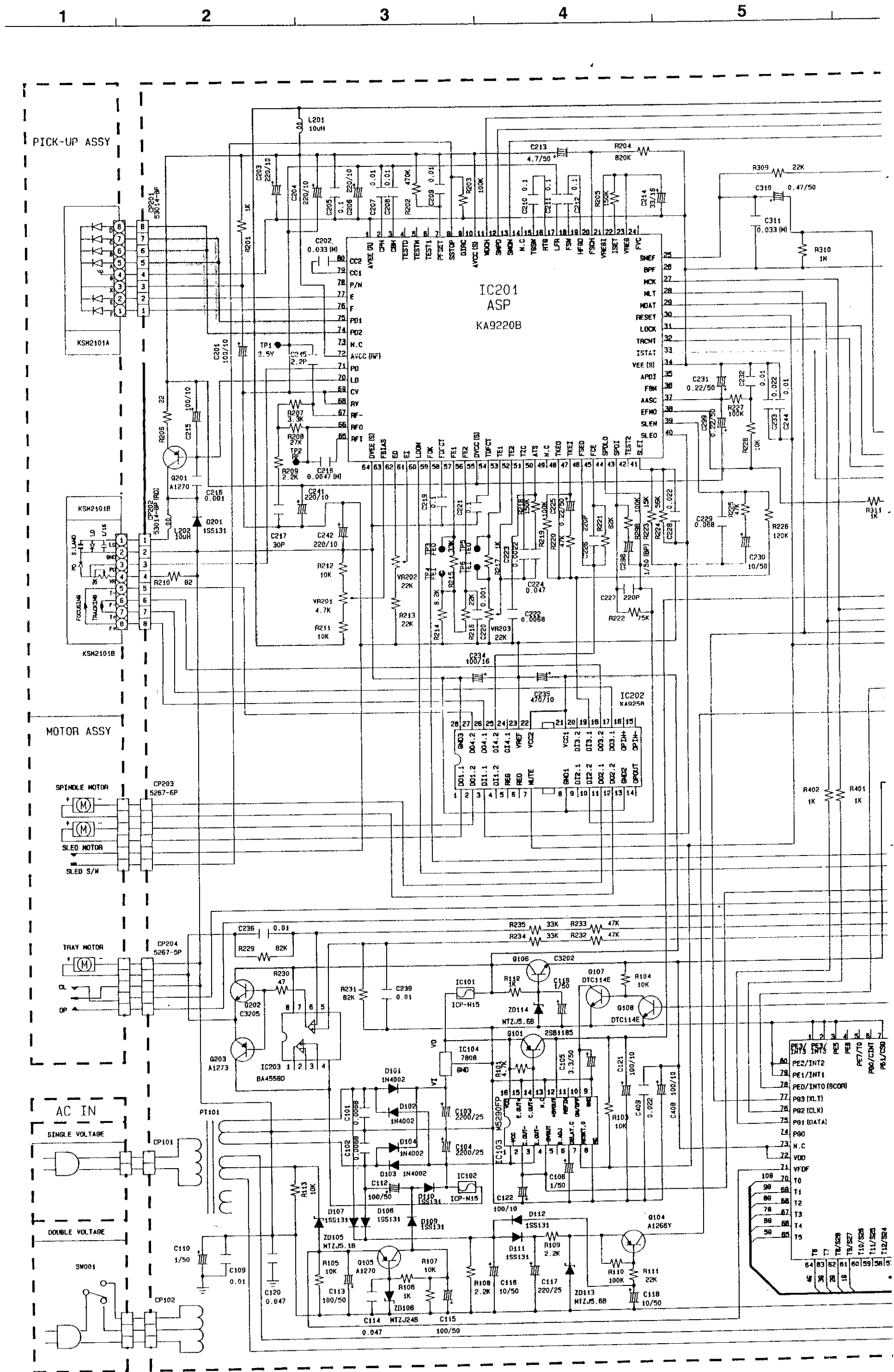
Ref. No.	Part No.	Part Name	Remarks	Ref. No.	Part No.	Part Name	Remarks	Q'ty
C304	255 1120 026	Film cap. 1500 pF/50V	CQ93M1H152J	CP101	—	Connector holder 2 P	L10835310200	1
C305,306	253 3615 009	Ceramic cap. 33 pF/50V	CC45SL1H330J	CP201	—	Connector wire 8 P Red	L10153014082	1
C309	253 9030 086	Ceramic cap. 0.022 μF/25V	CK45=1E223K	CP202	—	Connector wire 8 P	L10153014081	1
C310	254 4260 032	Electrolytic 0.47 μF/50V	CE04W1HR47M	CP203	—	Connector holder 6 P	L10252670601	1
C311	255 1121 083	Film cap. 0.033 μF/50V	CQ93M1H333J	CP204	—	Connector holder 5 P	L10252670501	1
C401	253 9030 086	Ceramic cap. 0.022 μF/25V	CK45=1E223K	CP401	—	26 P FP cable	L13152045261	1
C406	253 9030 086	Ceramic cap. 0.022 μF/25V	CK45=1E223K	CP701	—	Connector wire 3 P 160 mm	L00007590001	1
C407	254 4260 045	Electrolytic 1 μF/50V	CE04W1H010M	CP701	960 0011 005	26 P FP cable	L13152044261	1
C408	254 4252 037	Electrolytic 100 μF/10V	CE04W1A101M	TP001	—	Test pin	L42100004000	4
C409	253 9030 086	Ceramic cap. 0.022 μF/25V	CK45=1E223K	TP005,006	—	Test pin (2P)	L42100005000	1
C501,502	254 4252 037	Electrolytic 100 μF/10V	CE04W1A101M	—	—	Heat sink	212002008601	1
C503,504	254 4260 074	Electrolytic 4.7 μF/50V	CE04W1H4R7M	FLH701	960 0007 200	FLD holder	432002015601	1
C505,506	253 1055 072	Ceramic cap. 120 pF/50V	CK45B1H121K	J001-096	—	Jumper wire	L40200002002	96
C507,508	255 1121 096	Film cap. 0.039 μF/50V	CQ93M1H393J	J301,302	—	Jumper wire		2
C509,510	255 1120 042	Film cap. 2200 pF/50V	CQ93M1H222J	CP102B	—	Wire Black L=160 mm	L000016122001	1
C511,512	254 4252 037	Electrolytic 100 μF/10V	CE04W1A101M	CP102R	—	Wire Red L=160 mm	L000016122201	1
C513,514	253 1001 000	Ceramic cap. 330 pF/50V	CK45B1H331K	CP102W	—	Wire White L=160 mm	L000016122901	1
C515,516	254 3056 043	Electrolytic 4.7 μF/50V(Bipolar)	CE04D1H4R7MBP				Asia model only	
C517,518	253 1004 007	Ceramic cap. 1000 pF/50V	CK45B1H102K				Asia model only	
C519	254 4260 087	Electrolytic 10 μF/50V	CE04W1H100M				Asia model only	
C601	253 1004 007	Ceramic cap. 1000 pF/50V	CK45B1H102K					
C602	253 1001 000	Ceramic cap. 330 pF/50V	CK45B1H331K					
C603,604	253 1004 007	Ceramic cap. 1000 pF/50V	CK45B1H102K					
C701	253 1197 914	Ceramic cap. 0.01 μF/16V	CK14F1C104Z					
OTHER PARTS				Q'ty				
	—	(P.W.board)		(1)				
L201,202	960 0010 307	Inductor 10 mH	D33010070052	2				
SW701-707	LA2 60C9 008	Tact switch	G18000027000	7				
PT101	960 0083 525	Power transformer	820048041007	1				
			Europe model					
PT101	960 0083 525	Power transformer	820048041008	1				
			Asia model					
JK001	960 0010 006	2 P pin jack	G60102013001	1				
JK002	289 0098 006	Optical	E10013200001	1				
JK003,004	960 0004 407	Mini jack	G40103110201	2				
SW001	960 0062 407	Slide switch (Vol.sel.switch)	G06000120024	1				
			Asia model only					
XT301	DCD 2150 403	Crystal 16.9344 MHz	E80016R93401	1				
XT401	399 0107 007	Ceramic resonator CST4.19MGW	E8304R100000	1				

CD PLAYER SECTION

BLOCK DIAGRAM



SCHEMATIC DIAGRAM



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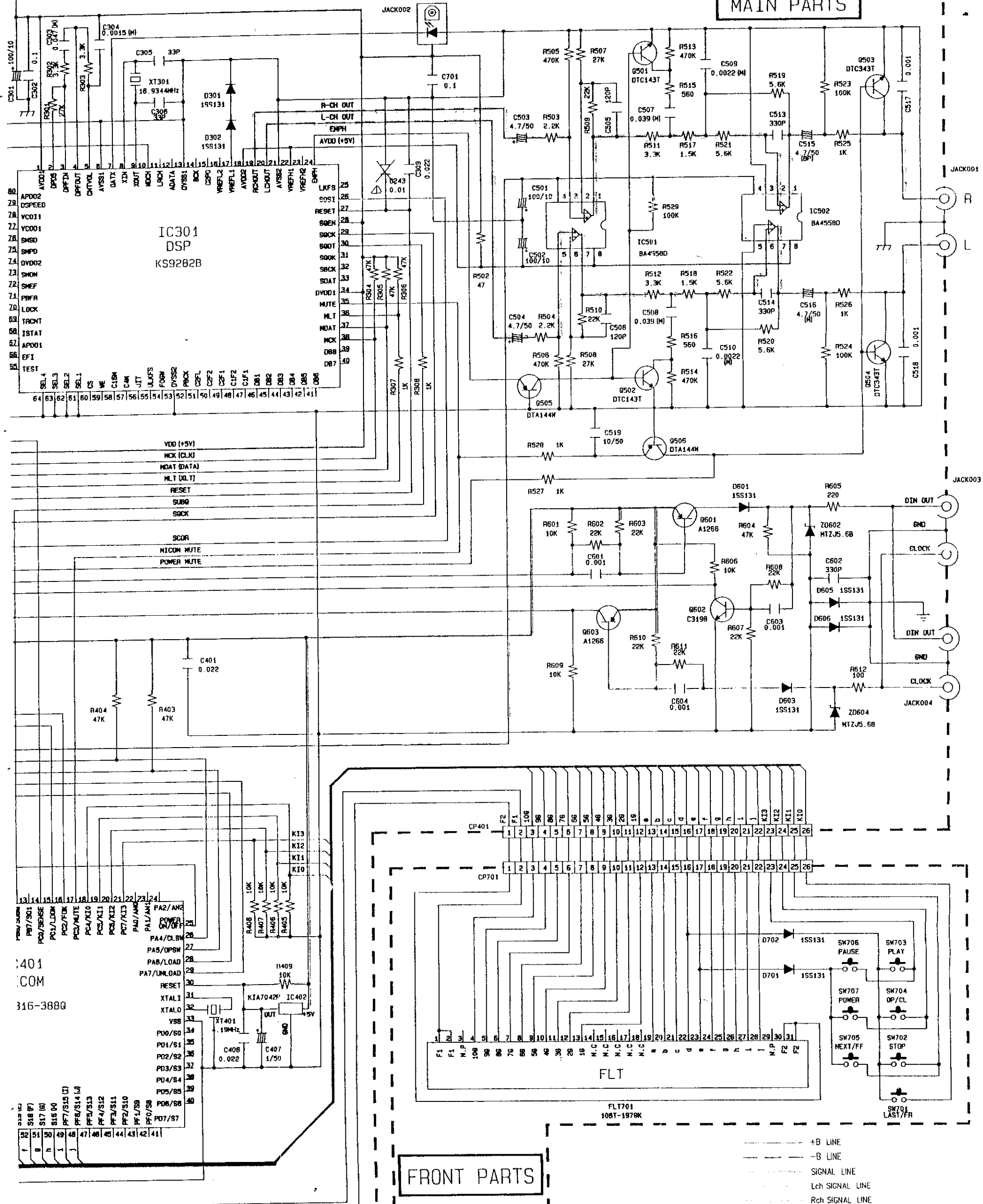
NOTES
ALL RESISTANCE VALUES IN OHM, K=1,000 OHM, M=1,000,000 OHM
ALL CAPACITANCE VALUES IN MICRO FARAD, P=MICRO-MICRO FARAD
EACH VOLTAGE AND CURRENT ARE MEASURED AT NO SIGNAL INPUT
CONDITION
CIRCUIT AND PARTS ARE SUBJECT TO CHANGE WITHOUT PRIOR
NOTICE.

WARNING:
Parts marked with this symbol Δ have critical characteristics.
Use ONLY replacement parts recommended by the manufacturer.

CAUTION:
Before returning the unit to the customer, make sure you make either (1) a
leakage current check or (2) a line to chassis resistance check. If the leakage
current exceeds 0.5 milliamperes, or if the resistance from chassis to either side
of the power cord is less than 240 kohms, the unit is defective.

WARNING:
DO NOT return the unit to the customer until the problem is located and
corrected.

MAIN PARTS



CD PLAYER SECTION

EXPLODED VIEW

PARTS LIST OF EXPLODED VIEW
CD PLAYER SECTION(UCD-F88)

Ref. No.	Part No.	Part Name	Remarks	Q'ty
1	—	Main P.W.B. unit		1s
1-1	—	Main P.W.B. unit	702802108003	(1)
			Asia model	
1-1	11111111	Main P.W.B. unit	702802108002	(1)
			Europe and U.K.model	
1-2	—	Front P.W.B. unit	702802108101	(1)
1-3	—	Voltage sei P.W.B. unit	Asia model	(1)
2	960 0082 801	Front panel	306702089801	1
3	960 0082 908	Inner panel	321702015101	1
4	960 0083 208	Window	507702039201	1
5	960 0003 505	Foot cushion	405002007501	4
6	960 0003 408	Front foot	400700006101	2
7	960 0003 204	Rear foot	400000060101	2
8	960 0009 208	Chassis	320002004601	1
9	960 0083 017	Rear panel	320702005612	1
			Asia model	
9	960 0083 020	Rear panel	320702005610	1
			Europe and U.K.model	
10	960 0006 308	Top cover	300002009601	1
11	960 0081 802	Power button	509702002103	1
12	960 0083 101	Loader panel	431702044101	1
13	960 0059 106	CD Mechanism Ass'y	803800090006	1
14	960 0003 301	Supporter P.W.B.	407000160101	3
15	960 0009 402	Mecha holder	400002002101	4
△	17 960 0003 602	Cord bush	438000018000	1
△	18 960 0032 301	AC Cord	LD6100041001	1
△	19 960 0083 512	Power transformer	820048041008	1
			Asia model	
△	19 960 0083 525	Power transformer	820048041007	1
			Europe and U.K.model	
20	960 0010 006	2P Pin jack	JACK001	1
21	269 0098 006	Optical terminal	JACK002	1
22	960 0004 407	Mini jack φ3.5	JACK003,004	2
23	960 0079 209	DENON Badge	563000042801	1
△	27 960 0062 407	Voltage selector	Asia model only	1
51	960 9000 130	Screw 3x8 Bltite BK/FH	B020030083F1	2
52	960 9000 114	Screw 3x8 Bltite ZNY/BH	B020030081B1	7
53	960 9000 208	Screw 3x8 Bltite BK/BH	B020030083B1	19
			Asia model	
53	960 9000 208	Screw 3x8 Bltite BK/BH	B020030083B1	17
			Europe and U.K.model	
54	960 9000 156	Screw 3x17 Bltite ZNY/BH	B020030171B1	7
55	960 9000 169	Screw 4x8 Cltite ZNY/BH	B020940081B1	2

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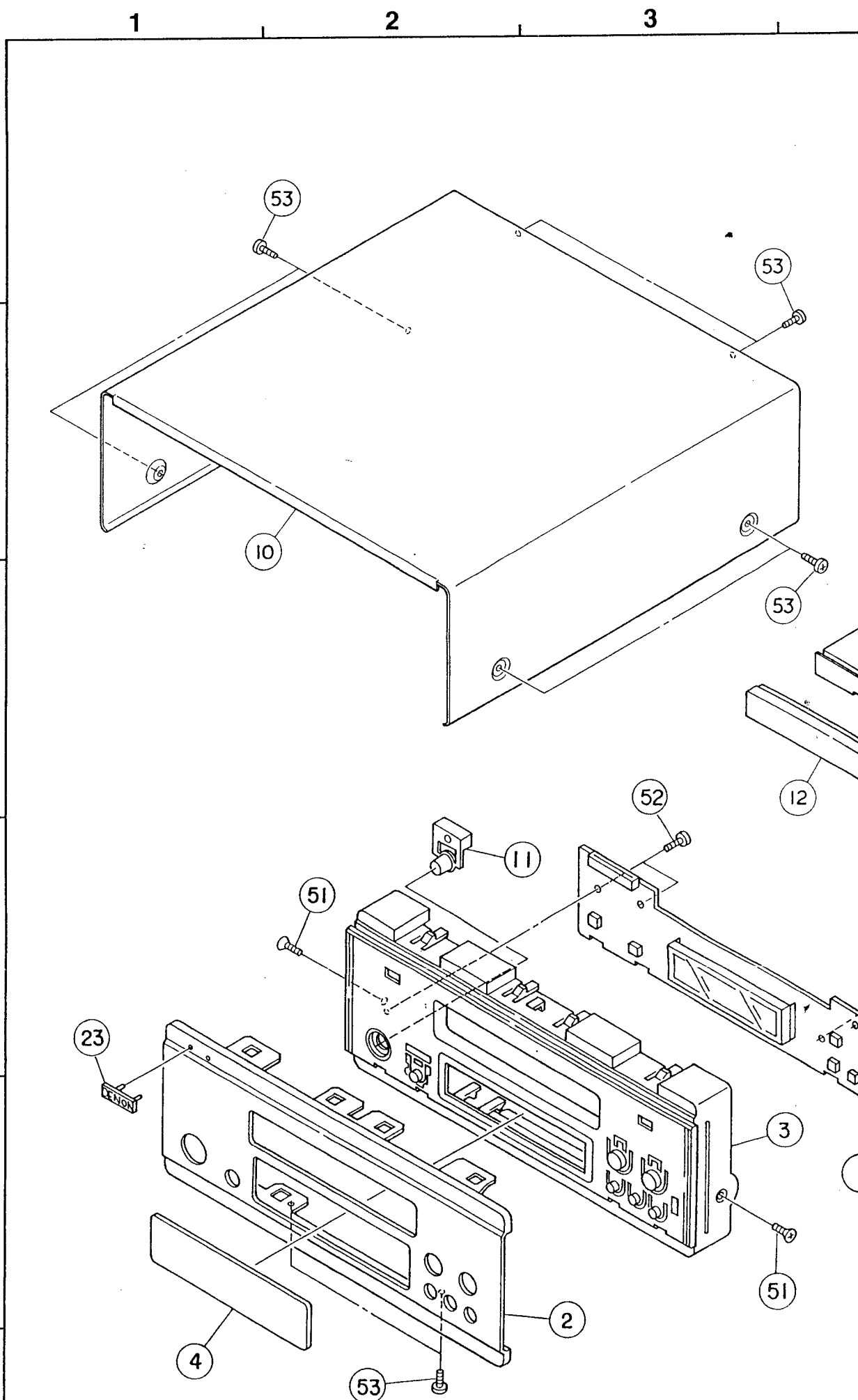
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H



NOTE FOR PARTS LIST

- Part indicated with the mark "△" are not always in stock and possibly to take a long period of time for supplying, or in some case supplying of part may be refused.
- When ordering of part, clearly indicate "1" and "1" (i) to avoid mis-supplying.
- Ordering part without stating its part number can not be supplied.
- Part indicated with the mark "★" is not illustrated in the exploded view.
- Not including Carbon Film ±5%, 1/4W Type in the P.W.Board parts list. (Refer to the Schematic Diagram for those parts.)

WARNING:

Parts marked with this symbol △ have critical characteristics.
Use ONLY replacement parts recommended by the manufacturer.

4

5

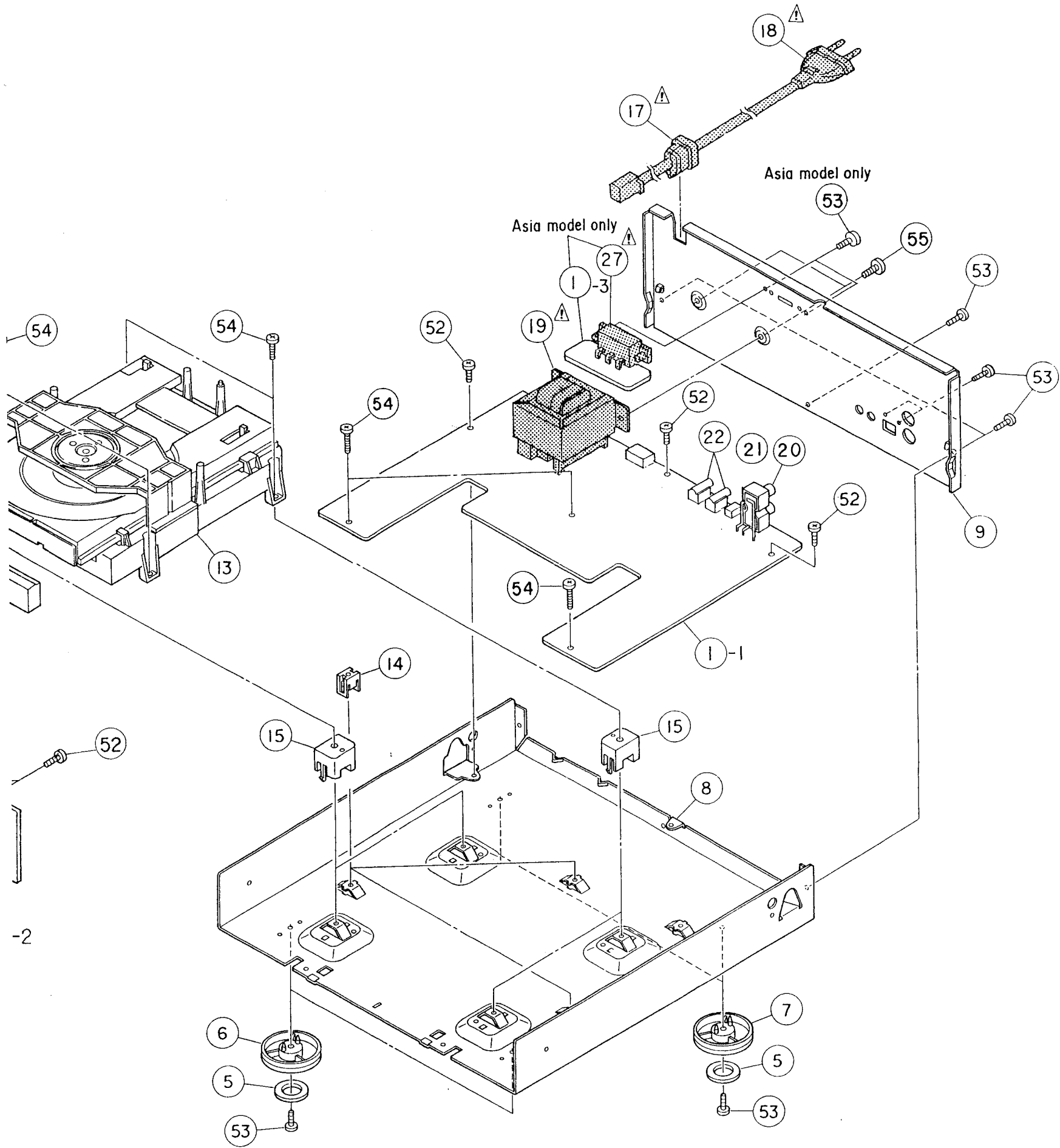
6

7

8

A

B



-2

DISASSEMBLY OF CD MECHANISM

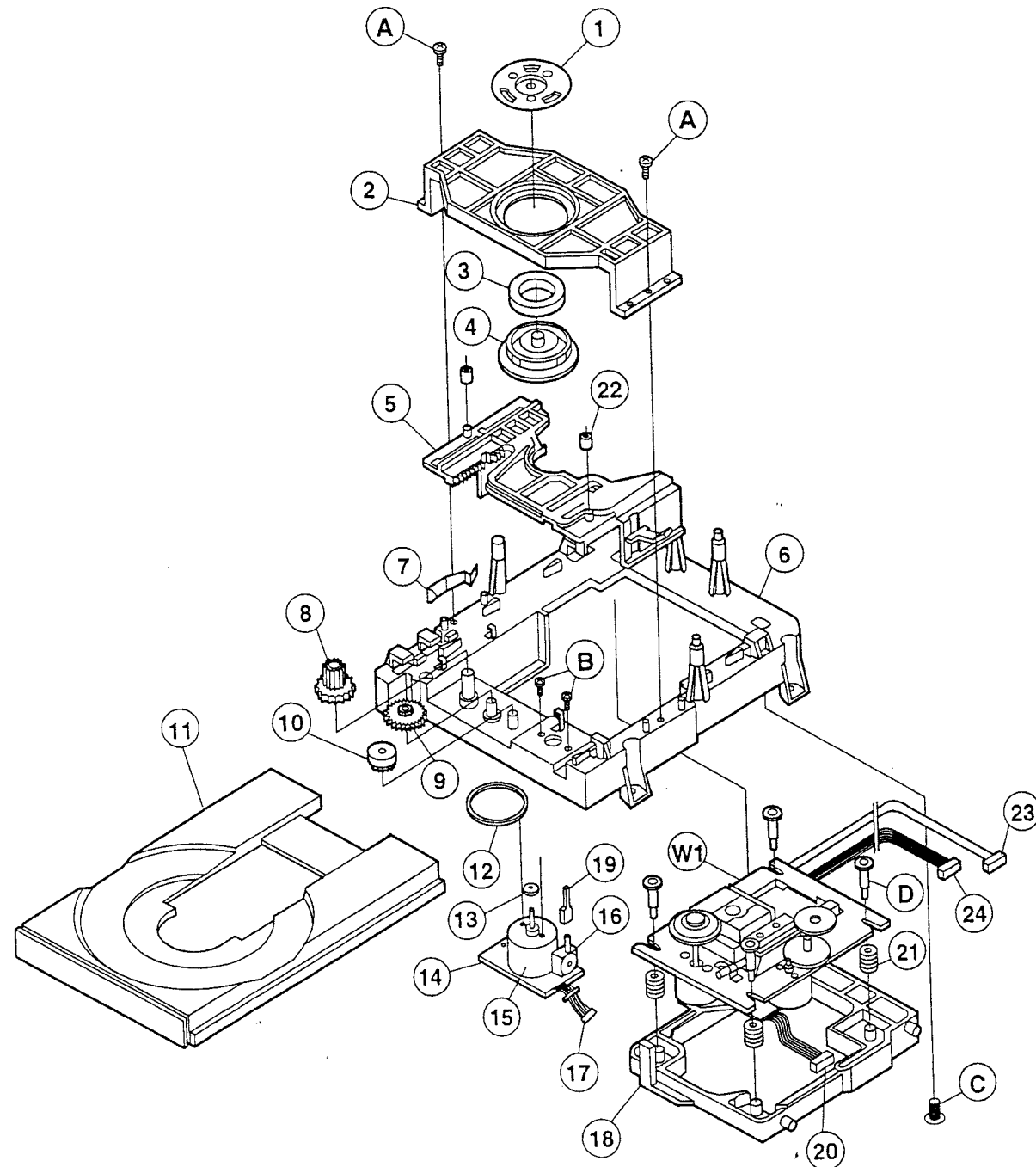
CD PLAYER SECTION

PARTS LIST OF MECHANISM UNIT
TRAVERSE SECTION (Part No.:960 0011 102)

Ref. No.	Part No.	Part Name	Remarks	Q'ty
1	S49 1756 501	Slide shaft		1
2	S26 2553 801	Insulator (S)		4
3	S26 4138 601	Tapping screw 2x5		6
4	-	Bracket		1
5	S26 2519 101	Coil spring		1
6	S26 2547 701	Center ring		1
7	499 0171 003	Optical pick up KSS210A		1
8	S26 2518 802	Gear (A)		1
9	SX2 6251 331	T/T motor chassis Ass'y		1
10	SX2 6251 321	Gear motor Ass'y		1
11	S16 3967 812	P.W.board Ass'y		1
12	S15 7208 511	Leaf switch		1
13	S15 6472 211	Connector pin		1
14	S76 2125 515	Screw 2x3 +P		1
15	S26 2608 101	Gear (B)		1

LOADER SECTION

TRAVERSE SECTION



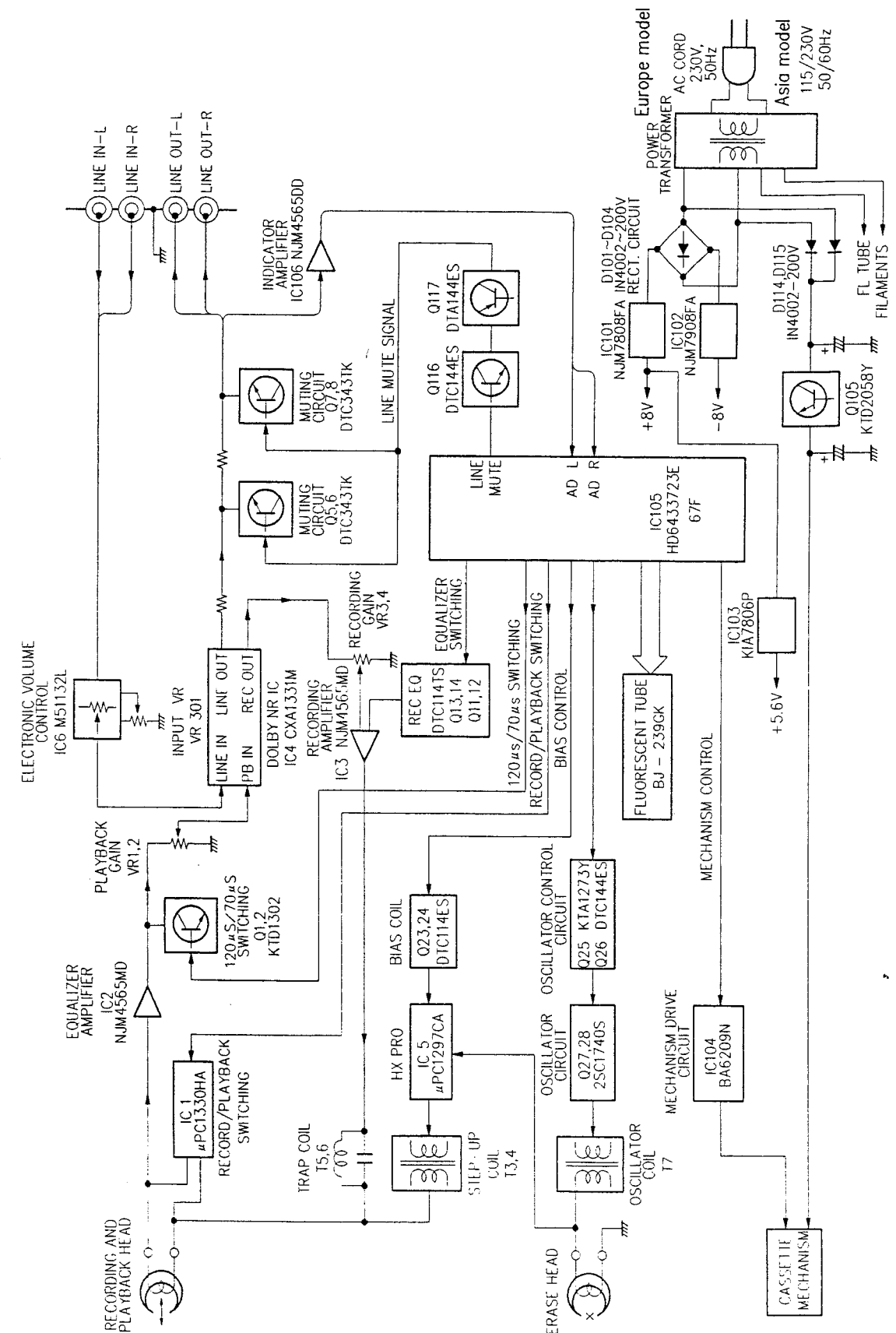
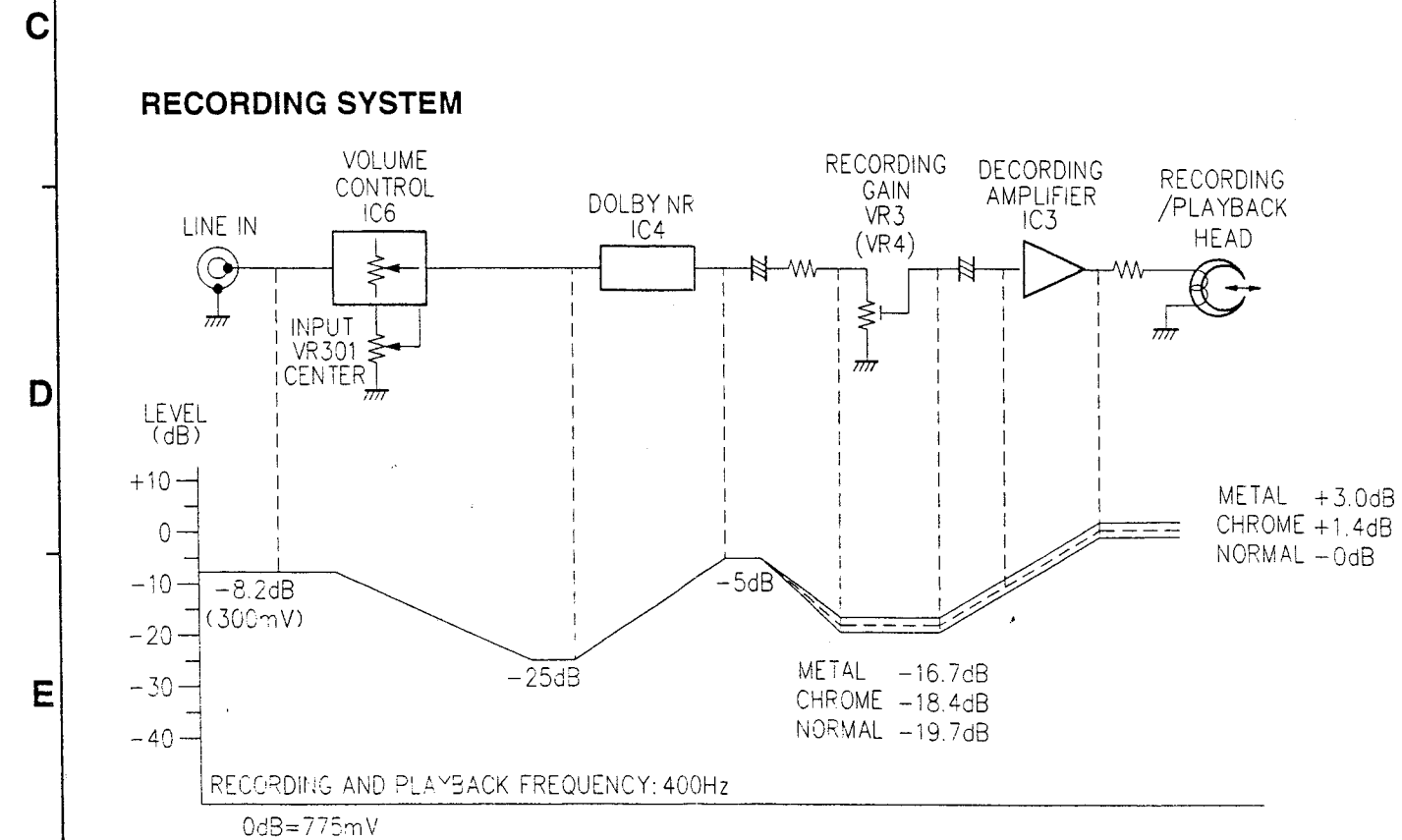
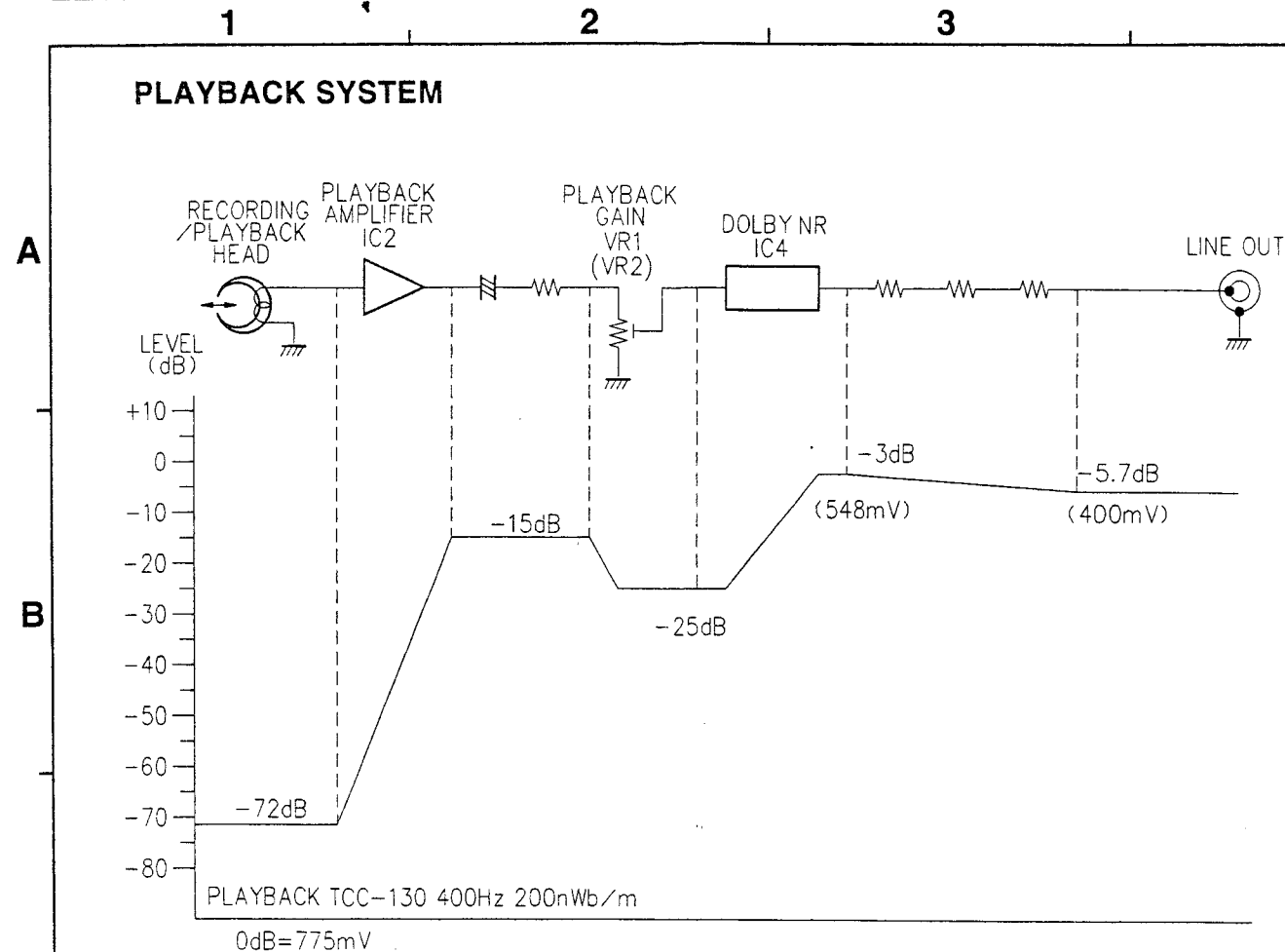
LOADER MECH. SECTION

Ref. No.	Part No.	Part Name	Remarks	Q'ty
1	960 0046 902	Clamper plate	447000406000	1
2	960 0046 106	Flapper	270000036000	1
3	960 0047 202	Magnet (±V)	7600GZ3400L1	1
4	960 0046 601	Clamper (±U)	433000043000	1
5	960 0046 708	Frame guide	435000642000	1
6	960 0046 203	Mech. base	320000510000	1
7	960 0046 407	Rack spring	372000336000	1
8	960 0045 806	Load gear	247000058000	1
9	960 0045 602	Center gear	247000045000	1
10	960 0045 709	Pulley gear	247000046000	1
11	960 0047 008	Tray	460000019001	1
12	960 0045 903	Tray belt	249000021000	1
13	960 0046 009	Motor pulley	250000008000	1
14	960 0047 105	Motor P.W.board	702001087000	1
15	960 0045 408	DC motor	RF-500TB 14415	1
			G70000016001	
16	960 0041 703	Leaf switch	G22000001000	1
17	-	Connector wire -5P	130 mm	1
18	960 0046 300	Feed frame	321000513000	1
19	960 0046 504	Holder	432000214000	1
20	-	Connector wire -6P	150 mm	1
21	960 0045 505	Insulator	124000001000	4
22	960 0046 805	Stopper	438000059000	1
23	-	Connector wire -8P	170 mm	1
24	-	Connector wire -8P	190 mm	1
25				
A	960 9000 318	Screw 3x10 B tite	B020HF6103B1	2
B	960 9000 305	Screw 2.6x5	B000HD5051B2	2
C	960 9000 321	Screw 3x8	1500HZ0780L1	1
D	960 9000 334	Screw 12.5x18.5	150000090000	4
W1	960 0011 102	CD mechanism	KSM-2101AB	1

CASSETTE DECK SECTION

LEVEL DIAGRAM

BLOCK DIAGRAM



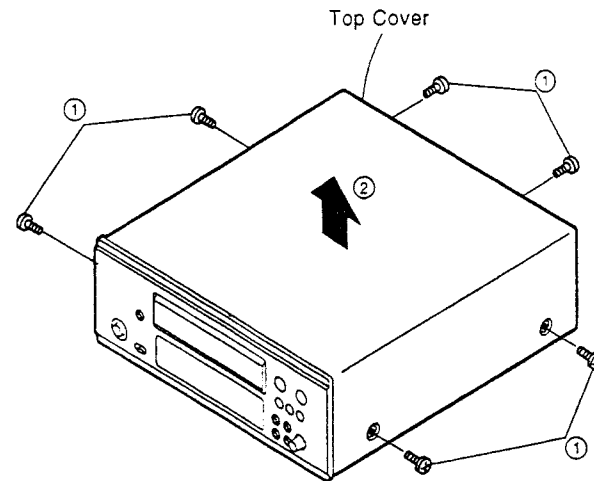
CASSETTE DECK SECTION

DISASSEMBLY PROCEDURES

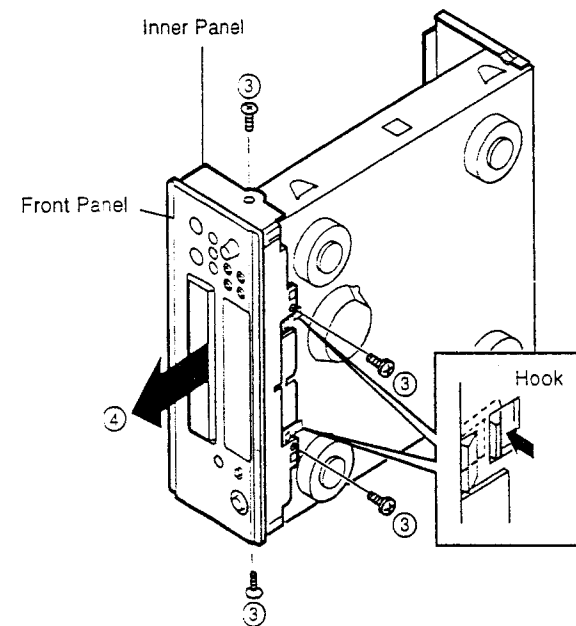
(Assembly is performed in the reverse order.)

1. Top Cover and Front Panel

- ① Remove 6 screws mounting on the Top Cover.
- ② Detach the Top Cover in the arrow direction.

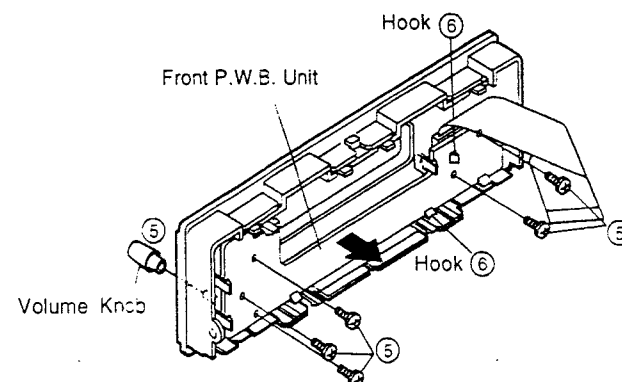


- ③ Remove 2 each screws fastening the Front Panel on the bottom and both side.
- ④ While releasing 2 hooks of the Inner Panel from the chassis, pull toward arrow direction and detach the Front Panel and the Inner Panel as a whole.



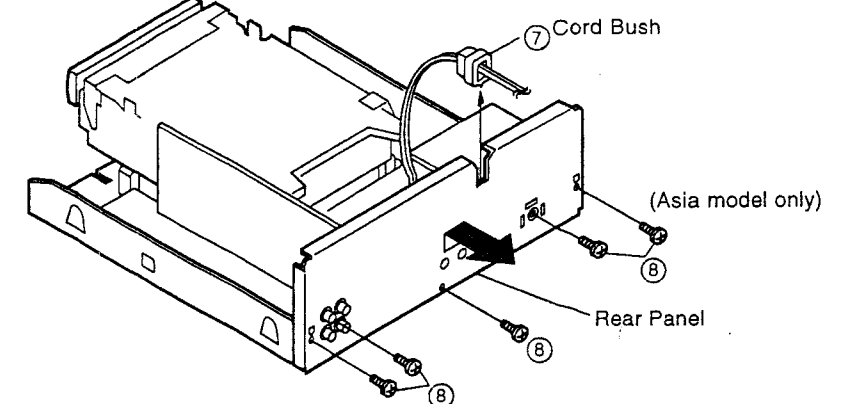
2. Front P.W.B. Unit

- ⑤ Pull out the Volume Knob, and remove 4 screws fastening the Front P.W.B. Unit.
- ⑥ While releasing 11 hooks, detach the Front P.W.B. Unit in the arrow direction.



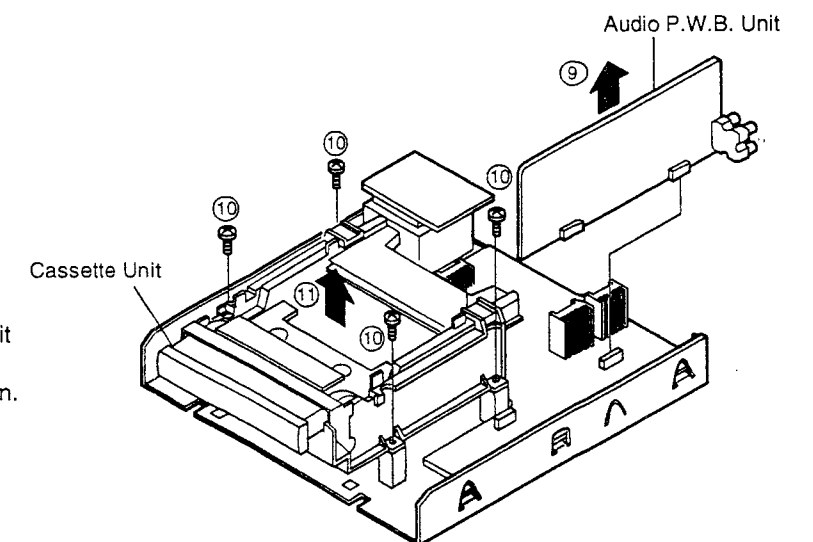
3. Rear Panel

- ⑦ Remove the Cord Bush from the Rear Panel.
- ⑧ Remove 5 screws (Europe model) / 7 screws (Asia model) fixing the Rear Panel, then detach the Rear Panel in the arrow direction.



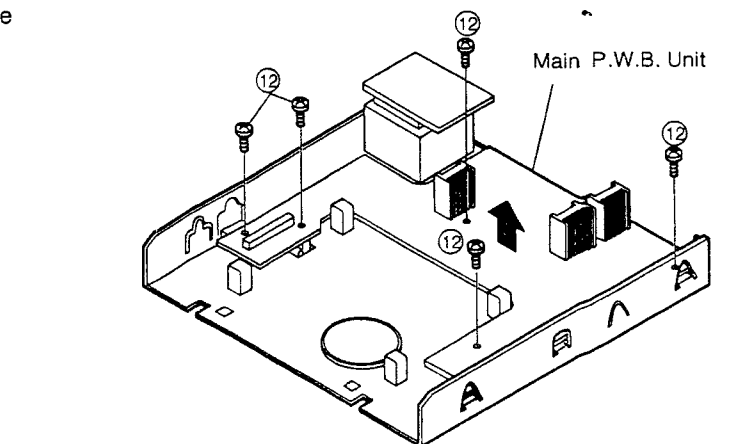
4. Audio P.W.B. Unit

- ⑨ Pull out the Audio P.W.B. Unit from connector as shown in figure.



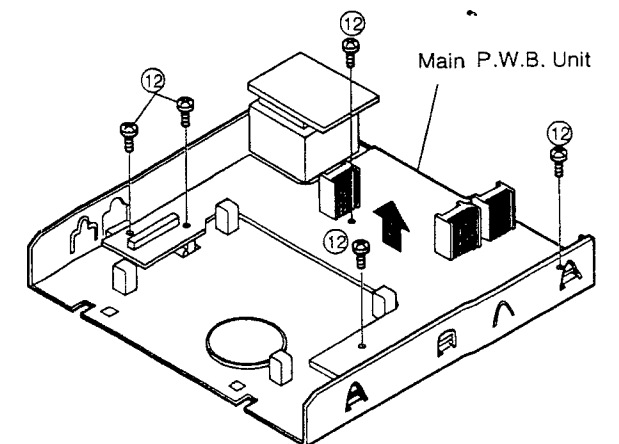
5. Cassette Unit

- ⑩ Remove 4 screws mounting the Cassette Unit on the chassis.
- ⑪ Detach the Cassette Unit in the arrow direction.



6. Main P.W.B. Unit

- ⑫ Remove 4 screws fastening the Main P.W.B. Unit and detach the Main P.W.B. Unit in the arrow direction.



CASSETTE DECK SECTION

ADJUSTMENTS

Adjusting and Checking the Mechanism Section

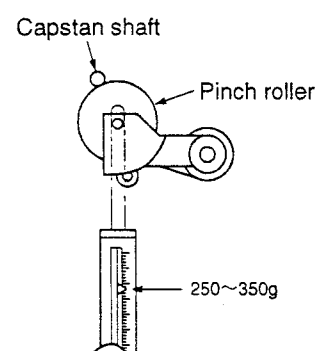
1. Replacement of the pinch roller

Before replacing the pinch roller, clean the tape contact surface of the pinch roller and the tape contact surface of the capstan shaft. After replacement, run a C-90 tape without a pad and check for the presence of tape curl at the tape guide portion of the head.

2. Checking the pinch roller pressure

Set to the playback condition and hook a bar-type spring scale to the bracket above the center line of the pinch roller. Pull the pinch roller away from the capstan shaft, then allow the pinch roller to come into contact with the capstan shaft and check that the reading of the bar-type spring scale is between 250 g and 350 g when the pinch roller starts to rotate.

Replace the pinch roller when the value falls outside of the specified range.

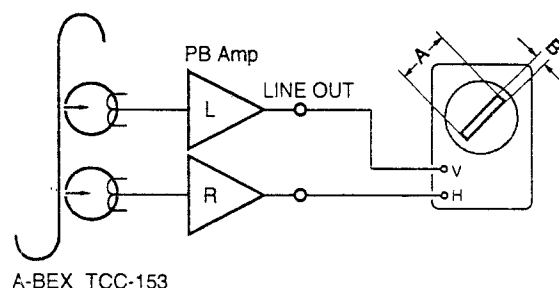


4. Adjustment of the recording/playback head

Azimuth adjustment

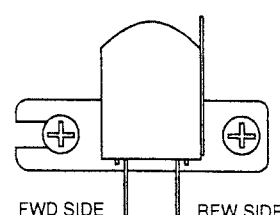
Load side A of the A-BEX TCC-153 test tape facing forward, and adjust.

- (1) Play in the FWD direction and turn the azimuth adjustment nut for the FWD side so that the Lissajous's figure becomes maximum at (A) and minimum at (B).
- (2) Play in the REW direction and turn the azimuth adjustment nut for the REW side as adjusting the FWD side method.
- (3) Adjust (1) and (2) again.
- (4) Apply screw lock to the adjustment locations.



A-BEX TCC-153

REC/PB HEAD



5. Checking the winding torque

Load a cassette type torque meter (Sony TW2111A at the FWD side) and check that the reading of the torque meter during playback is 30 to 70 g-cm at the center value.

When outside of the specified value range, check the voltage of the reel motor (approx. 4 V). When the voltage value is low, the torque is weak, and when high, the torque is strong.

6. Checking the back tension torque at the time of recording and playback

Load a cassette type torque meter (Sony TW2111A at the FWD side) and check that the reading of the torque meter during playback is 2 to 6 g-cm and that there is no unevenness.

7. Checking the FF and REW torque

Load a cassette type torque meter (Sony TW2231) and check that the value indicated by the torque meter for winding and rewinding is between 90 and 180 g-cm.

8. Checking the FF and REW time

Load a DENON HD-X/60 cassette tape, and check that the time for FF and REW is between 80 and 110 seconds. When outside of the specified range, check Steps 5 and 6.

9. Checking the erroneous erasure prevention, and the metal and chrome switch operations

Check that detection lever is operating the switch properly depending upon the presence or absence of a hole.

Adjusting and Checking the Electrical Section

Measuring instruments needed for the adjustments

- (1) Low frequency oscillator
- (2) Variable resistance attenuator
- (3) Electronic voltmeter
- (4) Oscilloscope
- (5) Frequency counter
- (6) Adjustment screwdriver
- (7) 4-sided adjustment rod for trap coil adjustments
- (8) Test tapes
(Sony TY-224)
(A-BEX TCC-153, TCC-130, TCC-262B/162B)
(DENON HD-X/60)
- (9) Mirror cassette for the transport (A-BEX TCC-902)

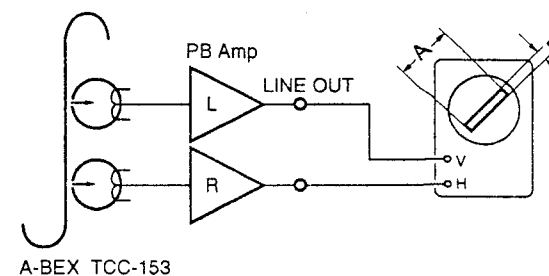
Adjustment precaution

- (1) Before adjustments, use gauze or a swab moistened with alcohol to wipe the surface of the heads, the capstan shaft, and the pinch roller.
- (2) Demagnetize the record/playback head and the erase head with a head eraser.
- (3) Completely demagnetize the driver to be used for the adjustments.
- (4) Unless otherwise specified, set the various operation controls as indicated below.
Input/output controls: Center
Dolby NR switch: Off

2. Azimuth adjustment

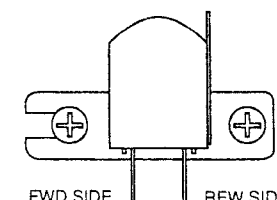
2-1 After making the tape transport check, load the test tape (A-BEX TCC-153).

2-2 Play back the test tape and turn the azimuth adjustment nut so that the Lissajous's figure becomes maximum at (A) and minimum at (B).



A-BEX TCC-153

REC/PB HEAD



3. Replacement of the recording/playback head assembly

Perform this procedure after removing the front panel.

3-1 Removal of the head assembly.

- (1) Remove the 2 head base fastening screws.
- (2) Remove the head base from the reed holder and the wire connector.

3-2 Mounting the recording/playback head assembly

Perform by following the steps of Section 3-1 Removal of the head assembly in reverse.

1. Tape transport check

Load the mirror cassette for the transport, and illuminate the area around the fixed guide of the record/playback head with a lamp and observe.

Check that the tape edge is not hitting the tape guide portion.

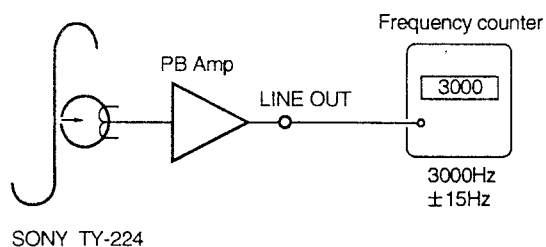
Note that the tape transport is the greatest factor affecting the performance of the cassette deck. Never move the inspection locations without good reason.

For information about replacement and adjustment of the record/playback head, see the section "Adjustment and checking of the mechanism".

CASSETTE DECK SECTION

3. Tape speed check and adjustment

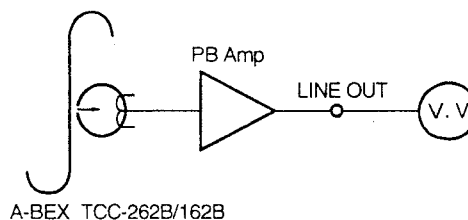
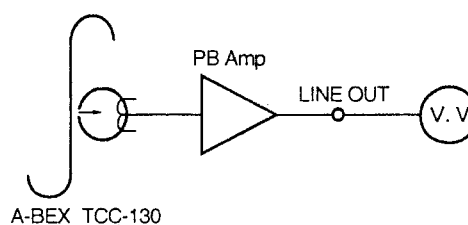
- 3-1 Connect the frequency counter to the LINE OUT pin and load the test tape (Sony TY-224).
- 3-2 Playback a test tape. At about halfway through the tape, where the tape transport is stable, confirm that the frequency counter will have a reading within the range of 3,000 Hz $\pm$ 15 Hz.



4-2 Checking the playback frequency responses

Play back the test tape (A-BEX TCC-262B/162B), and check that the frequency response satisfies the standard.

NOTE After making the azimuth adjustment with the 8 kHz at the start of the A-BEX TCC-262B test tape, perform check of the frequency responses. Also, after the check make an azimuth adjustment again with A-BEX TCC-153, then apply screw lock.

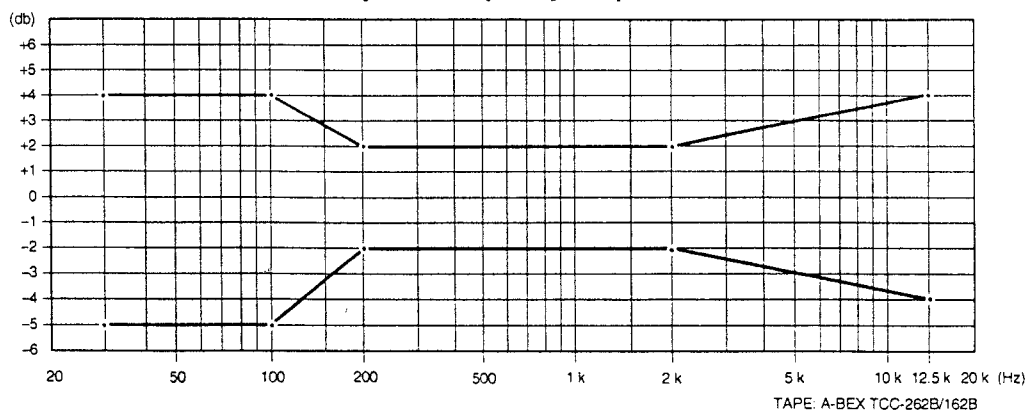


4. Adjustment of the playback system

4-1 Playback level

Play back the test tape for the Dolby standard level (A-BEX TCC-130), and adjust VR1 (Left channel) and VR2 (right channel) so that the level of the LINE OUT pin becomes -5.7 dBm (400 mV). (Load resistance of 47 kohm)

Playback Frequency Response



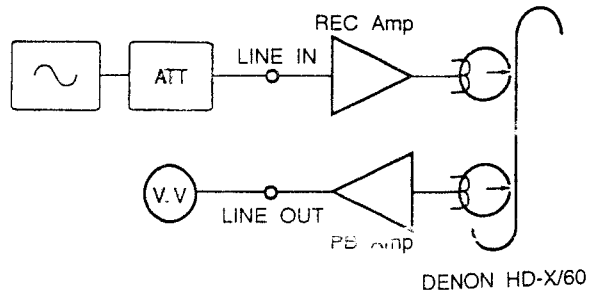
CASSETTE DECK SECTION

5. Adjustment of the recording system

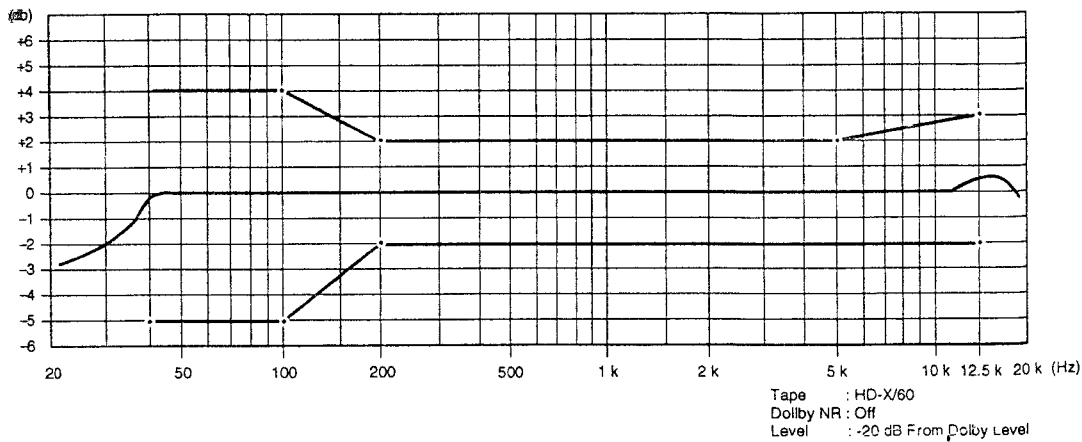
5-1 Adjustment of the recording and playback overall frequency responses

- (1) Load the DENON HD-X/60 test tape, record a signal of -20 dBm (30mV) 1 kHz input level, and play back.
- (2) Set the input signal to 10 kHz, record, and play back.

Adjust VR5 (left channel) and VR6 (right channel) so that the response specifications of the diagram below are satisfied with respect to the 1 kHz output level.



Recording/Playback Overall Frequency Response



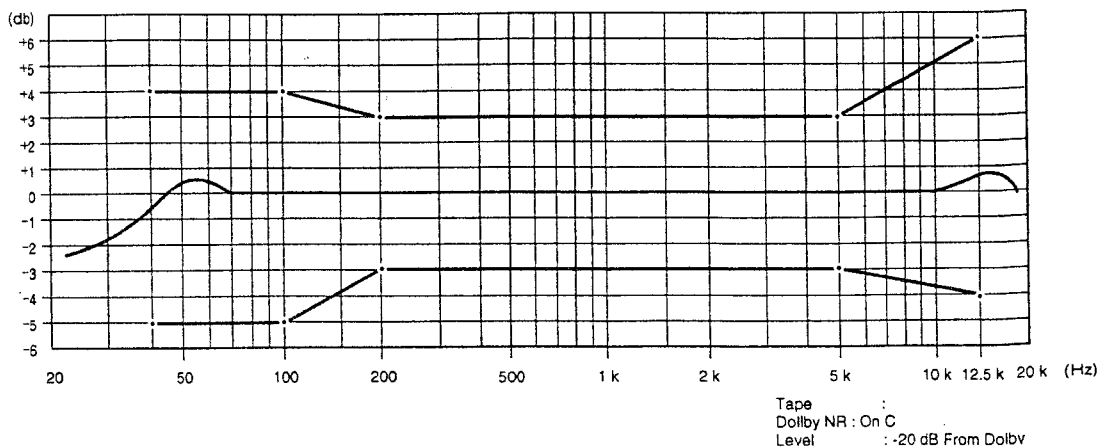
5-2 Adjustment of the recording/playback level

- (1) Load the DENON HD-X/60 test tape, record a signal of 1 kHz (-20 dBm), and play back.
- (2) Adjust VR3 (left channel) and VR4 (right channel) so that the output of the LINE OUT pin becomes the same as the output at the time of the recording monitor.

5-3 Checking the Dolby C recording and playback overall frequency response.

- (1) Set the Dolby NR switch to the "C" positions.
- (2) Use the DENON HD-X/60 test tape to record and play back according to the outline of Section 5-1, then check that the response specifications have been satisfied.

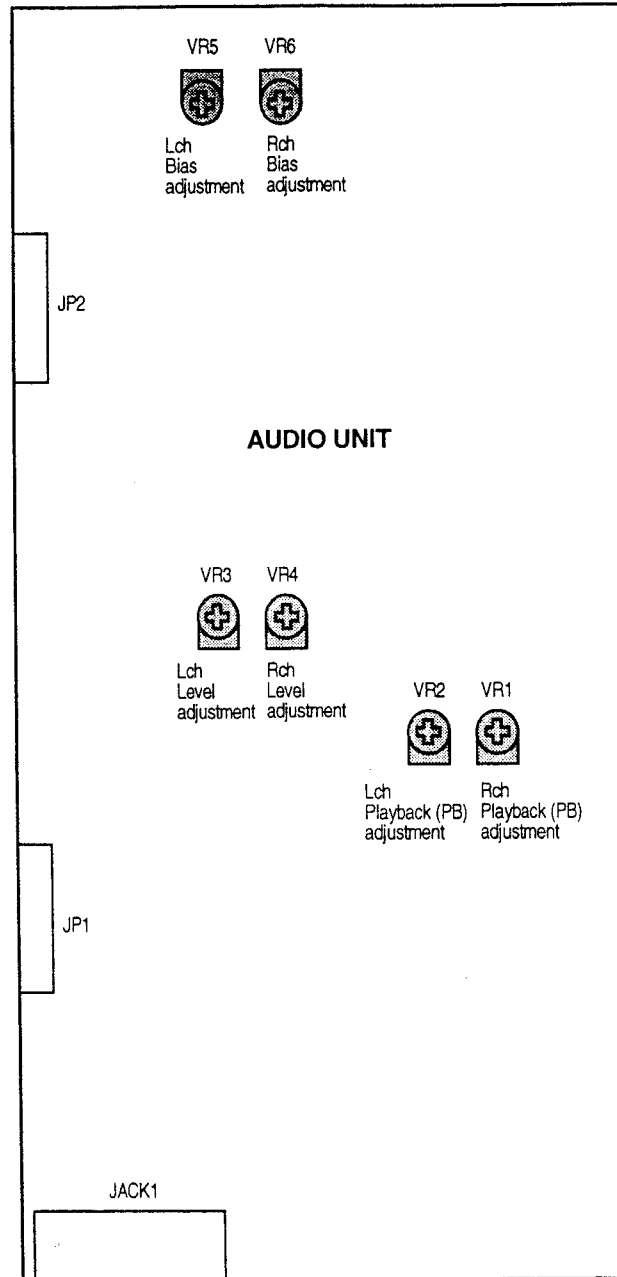
Recording/Playback level Overall Frequency



CASSETTE DECK SECTION

Outline Diagram of Adjustment Locations

Audio Unit Ass'y (Component side)

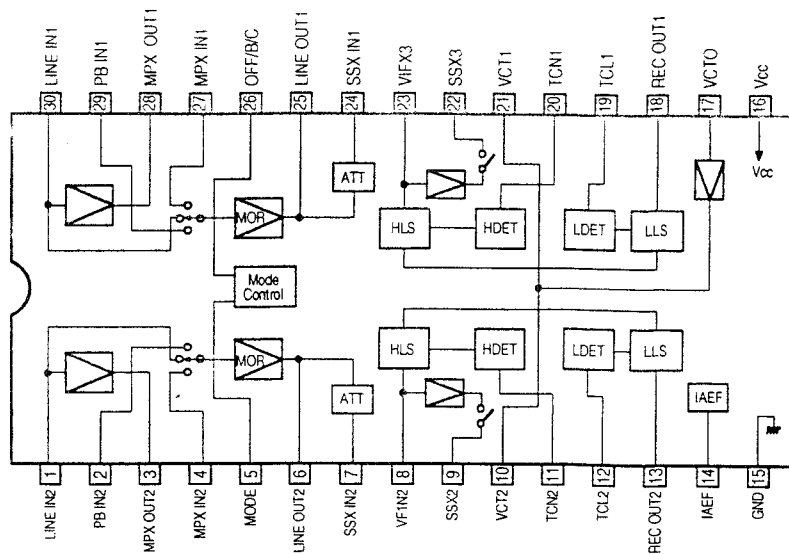
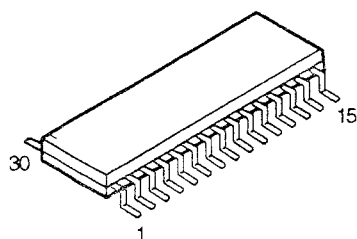
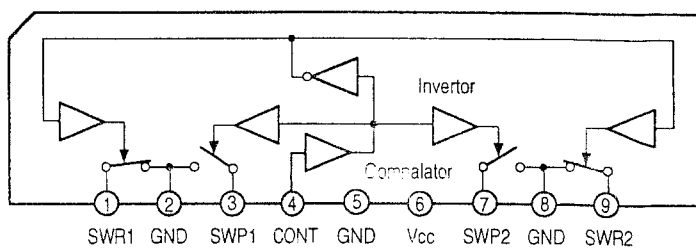
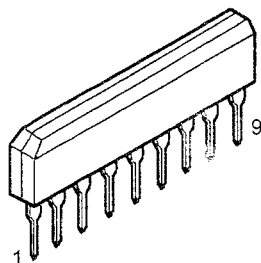
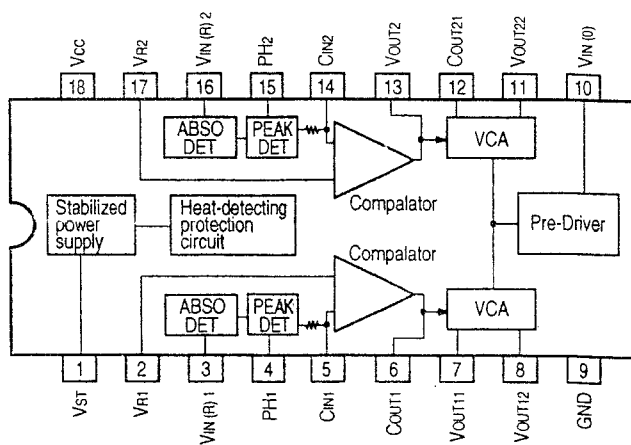
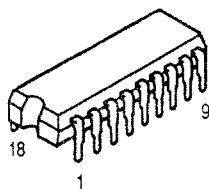


CASSETTE DECK SECTION

SEMICONDUCTORS

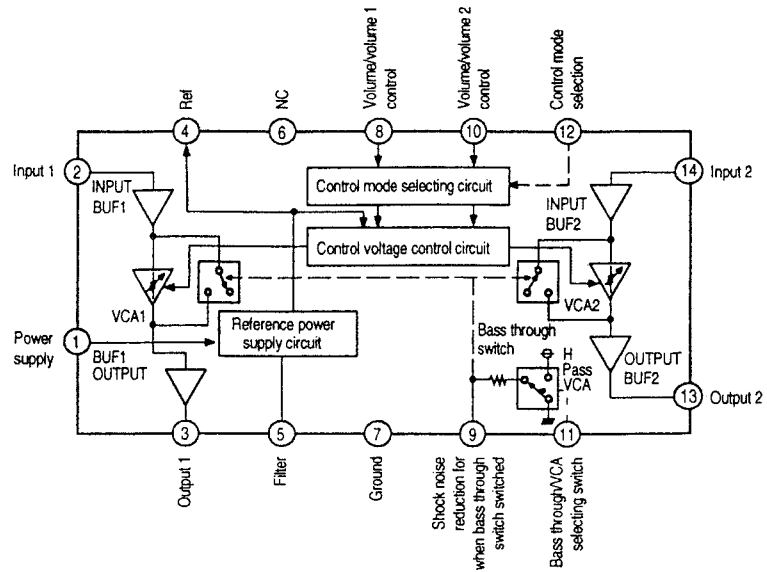
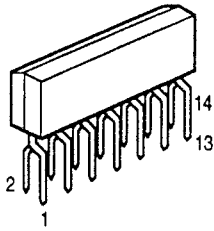
IC's

CXA1331M (IC004)

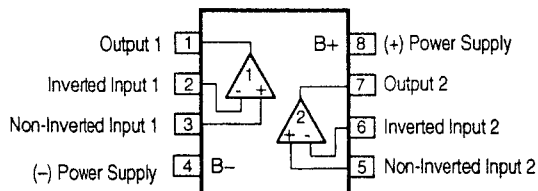
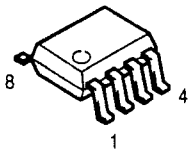
 μ PC1330HA (IC001) μ PC1297CA (IC005)
Dolby HX Pro.

CASSETTE DECK SECTION

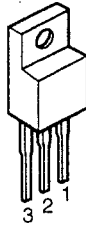
M51132L (IC006)



NJM4565DD (IC106)
NJM4565MD (IC002,003)

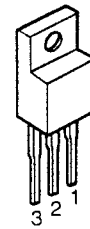


NJM7908FA (IC102)
(Three-terminal negative
constant voltage power supply)



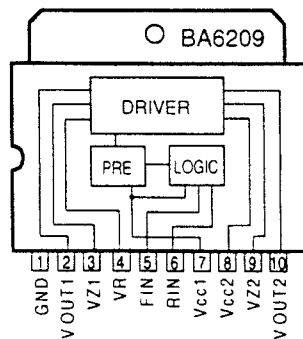
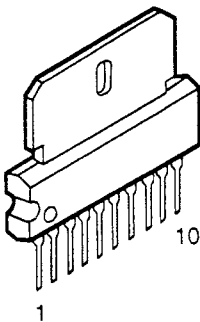
1: Output
2: Input
3: GND

KIA7806P (IC103)
NJM7808FA (IC101)
(Three-terminal positive
constant voltage power supply)



1: Output
2: GND
3: Input

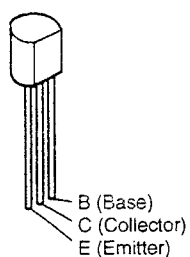
BA6209N (IC104)
Reversible motor driver (2 circuit built in)



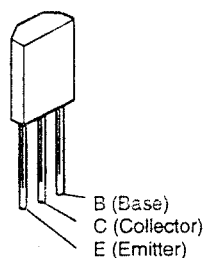
CASSETTE DECK SECTION

TRANSISTORS

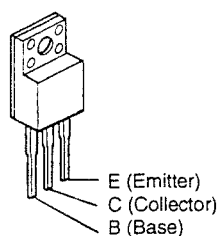
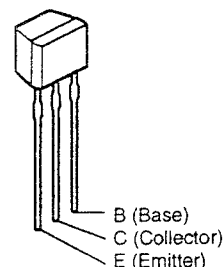
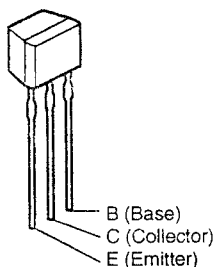
KTD1302



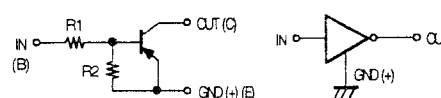
KTA1273 (Y)



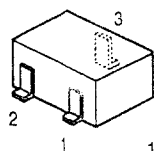
KTD2058 (Y)

2SA933S (S)
2SC1740S (R)DTA144ES
DTC114ES
DTC114TS
DTC124ES
DTC144ESDTA144EK } PNP type
DTA144ES }DTC114ES } NPN type
DTC114TK }
DTC114TS }
DTC124ES }
DTC144EK }
DTC144ES }
DTC343TK }

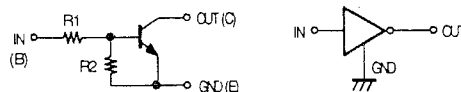
DTA EK/ES series



	R1	R2
DTA144ES	47 kohm	47 kohm
DTA144EK	47 kohm	47 kohm

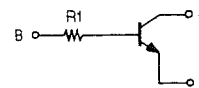
DTA144EK
DTC114TK
DTC144EK
DTC343TK1: GND/Emitter
2: In/Base
3: Out/Collector

DTC EK/ES series



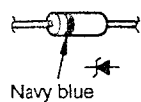
	R1	R2
DTC114ES	10 kohm	10 kohm
DTC124ES	22 kohm	22 kohm
DTC144EK	47 kohm	47 kohm
DTC144ES	47 kohm	47 kohm

DTC TK/TS series

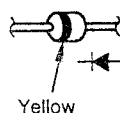


	R1
DTC114TS	10 kohm
DTC114TK	10 kohm
DTC343TK	4.7 kohm

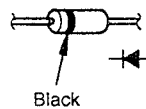
DIODES

MTZJ3.9B MTZJ9.1B
MTZJ5.6B MTZJ12B
MTZJ6.2B MTZJ20B
MTZJ7.5B

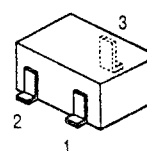
1SS131



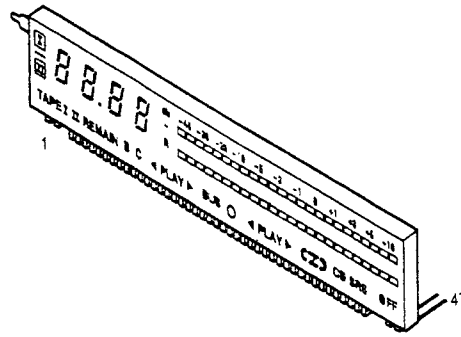
1N4002A



KDS226S

1: Cathode1
2: Anode2
3: Anode1/Cathode2

Fluorescent Display Tube BJ239GK (FLT301)
(Part No. : 393 8014 000)



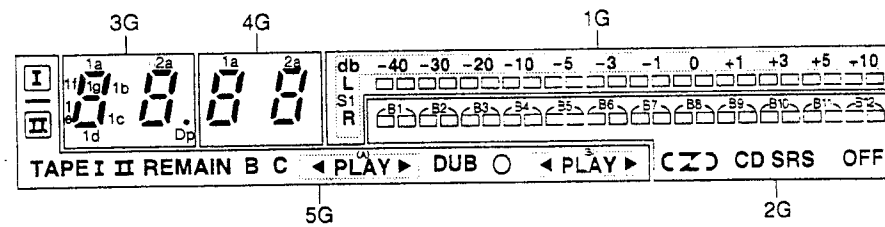
Pin Connection

Pin No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Connection	F1	F1	NP	NP	1G	2G	3G	4G	5G	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC

Pin No.	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47
Connection	NC	NC	P17	P16	P15	P14	P13	P12	P11	P10	P9	P8	P7	P6	P5	P4	P3	P2	P1	NP	NP	F2	F2

NOTE 1) F1 and F2 : Filaments
2) NP : No pin
3) NC : No connection
4) 1G through 5G : Grid

Grid Assignment

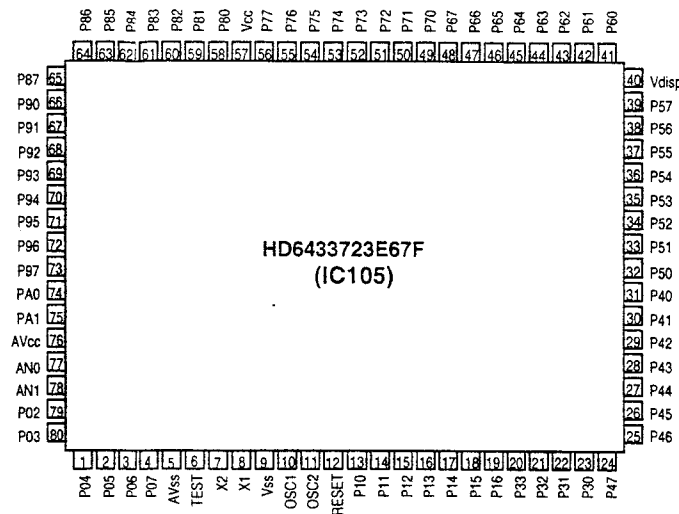
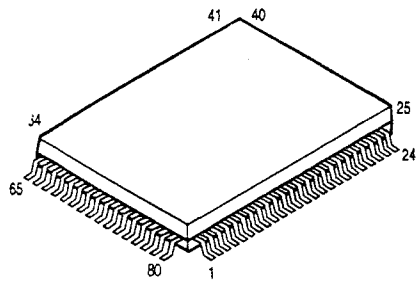


Anode Connection

	5G	4G	3G	2G	1G
P1	TAPE	1a	1a	B1	B1
P2	I	1b	1b	B2	B2
P3	II	1c	1c	B3	B3
P4	REMAIN	1d	1d	B4	B4
P5	B	1e	1e	B5	B5
P6	C	1f	1f	B6	B6
P7	◀	1g	1g	B7	B7
P8	PLAY	2a	2a	B8	B8
P9	▶	1b	1b	B9	B9
P10	DUB	2c	2c	B10	B10
P11	○	2d	2d	B11	B11
P12	◀	2e	2e	B12	B12
P13	PLAY	2f	2f	C	S1
P14	▶	2g	2g	Z	-
P15	I	-	Dp	U	-
P16	-	-	-	CD SRS	-
P17	II	-	-	OFF	-

CASSETTE DECK SECTION

MICROPROCESSOR DOCUMENTATION

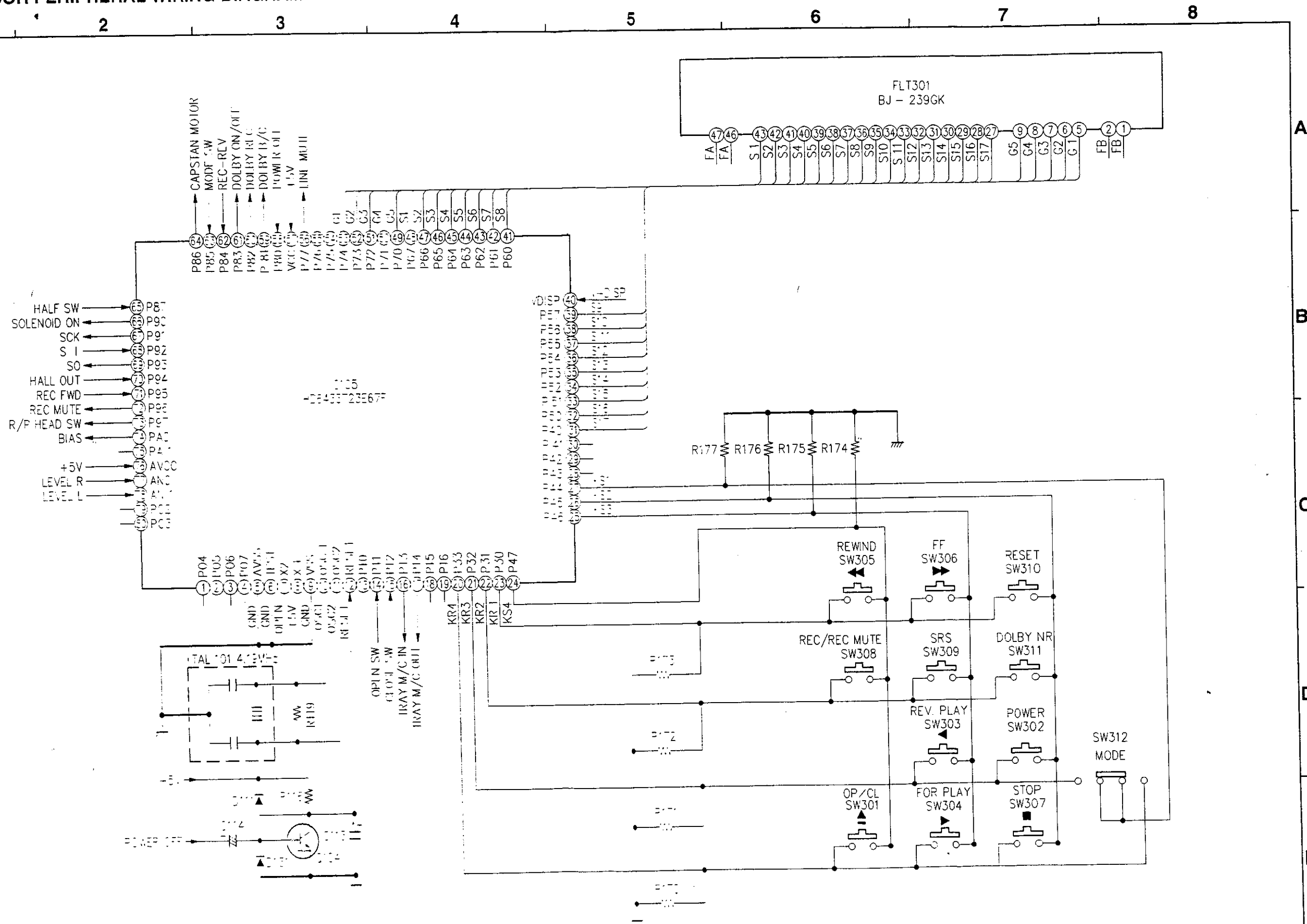
HD6433723E67F
(IC105)

HD6433723E67F Terminal Function

Pin No.	Terminal Name	I/O	PULL U/D	ACT	Port Name	Function
1	P04	I	—	—		Not used.
2	P05	I	—	—		Not used.
3	P06	I	—	—		Not used.
4	P07	I	—	—		Not used.
5	AVSS	I	—	—	AVSS	A/D GND.
6	TEST	I	—	—	TEST	GND.
7	X2	O	—	—	X2	Not used.
8	X1	I	—	—	X1	+5V.
9	VSS	I	—	—	VSS	GND.
10	OSC1	I	—	—	OSC1	System oscillation input terminal (4.19 MHz).
11	OSC2	O	—	—	OSC2	System oscillation output terminal (4.19MHz).
12	RESET	I	—	L	RESET	System reset input signal ("L" to reset).
13	P10	—	—	—		Not used.
14	P11	I	—	H	OPEN SW	Becomes "H" at switch open.
15	P12	I	—	H	CLOSE SW	Becomes "H" at switch close.
16	P13	O	—	H	TARY M/C IN	Becomes "H" at tray loading in.
17	P14	O	—	H	TRAY M/C OUT	Becomes "H" at tray loading out.
18	P15	—	—	—		Not used.
19	P16	—	—	—		Not used.
20	P33	I	P/D GND	H	KR4	Key reading signal 4.
21	P32	I	P/D GND	H	KR3	Key reading signal 3.
22	P31	I	P/D GND	H	KR2	Key reading signal 2.
23	P30	I	P/D GND	H	KR1	Key reading signal 1.
24	P47	O	P/D GND	H	KS4	Key scan signal 4.
25	P46	O	P/D GND	H	KS3	Key scan signal 3.
26	P45	O	P/D GND	H	KS2	Key scan signal 2.
27	P44	O	P/D GND	H	KS1	Key scan signal 1.
28	P43	O	—	H		Not used.
29	P42	O	—	H		Not used.

Pin No.	Terminal Name	I/O	PULL U/D	ACT	Port Name	Function
30	P41	O	—	H		Not used.
31	P40	O	P/D Vdisp	H	S17	FLT indication segment terminal (17).
32	P50	O	P/D Vdisp	H	S16	FLT indication segment terminal (16).
33	P51	O	P/D Vdisp	H	S15	FLT indication segment terminal (15).
34	P52	O	P/D Vdisp	H	S14	FLT indication segment terminal (14).
35	P53	O	P/D Vdisp	H	S13	FLT indication segment terminal (13).
36	P54	O	P/D Vdisp	H	S12	FLT indication segment terminal (12).
37	P55	O	P/D Vdisp	H	S11	FLT indication segment terminal (11).
38	P56	O	P/D Vdisp	H	S10	FLT indication segment terminal (10).
39	P57	O	P/D Vdisp	H	S9	FLT indication segment terminal (9).
40	Vdisp	I	—	—	Vdisp	Power supply for FLT.
41	P60	O	P/D Vdisp	H	S8	FLT indication segment terminal (8).
42	P61	O	P/D Vdisp	H	S7	FLT indication segment terminal (7).
43	P62	O	P/D Vdisp	H	S6	FLT indication segment terminal (6).
44	P63	O	P/D Vdisp	H	S5	FLT indication segment terminal (5).
45	P64	O	P/D Vdisp	H	S4	FLT indication segment terminal (4).
46	P65	O	P/D Vdisp	H	S3	FLT indication segment terminal (3).
47	P66	O	P/D Vdisp	H	S2	FLT indication segment terminal (2).
48	P67	O	P/D Vdisp	H	S1	FLT indication segment terminal (1).
49	P70	O	P/D Vdisp	H	G5	FLT indication grid terminal (5).
50	P71	O	P/D Vdisp	H	G4	FLT indication grid terminal (4).
51	P72	O	P/D Vdisp	H	G3	FLT indication grid terminal (3).
52	P73	O	P/D Vdisp	H	G2	FLT indication grid terminal (2).
53	P74	O	P/D Vdisp	H	G1	FLT indication grid terminal (1).
54	P75	—	—	—		Not used.
55	P76	—	—	—		Not used.
56	P77	O	P/D GND	L	LINE MUTE	"L" to line mute ON, "H" to signal.
57	VCC	I	—	—	VCC	System power supply +5V.
58	P80	I	—	L	POWER OFF	Power OFF detection signal ("L" at OFF).
59	P81	O	—	H/L	DOLBY B/C	Dolby "B" at "H", Dolby "C" at "L".
60	P82	O	—	L/H	DOLBY REC	Dolby recording at "L", Dolby playback at "H".
61	P83	O	—	L/H	DOLBY ON/OFF	Dolby ON at "L", Dolby OFF at "H".
62	P84	I	—	L	INH-R	REV recording inhibit at "L", REV recording at "H".
63	P85	I	—	H	MODE SW	Head up at "H", head down at "L".
64	P86	O	—	H	CPM	Capstan motor ON at "H".
65	P87	I	—	H	HALF SW	Tape detection exists at "H", tape detection not exists at "L".
66	P90	O	—	H	SOL	Solenoid ON at "H".
67	P91	O	—	L	SCK	Serial communication clock signal (cycle: 62.5 ms).
68	P92	I	—	L	SI	Serial data input signal.
69	P93	O	—	L	SO	Serial data output signal.
70	P94	I	—	H/L	HALL OUT	Reel sensor detection input signal.
71	P95	I	—	L	INH-F	FWD recording inhibit at "L", FWD recording at "H".
72	P96	O	—	H	REC-MUTE	Recording mute at "H", recording at "L".
73	P97	O	—	H/L	R/P HEAD SW	REC/PAUSE/MUTE at "H", others at "L".
74	PA0	O	—	H	BIAS	ON recording at "L", others at "H".
75	PA1	—	—	—		Not used.
76	AVCC	I	—	—	AVCC	+5V.
77	AN0	I	—	—	LEVEL "R"	R-ch level input signal.
78	AN1	I	—	—	LEVEL "L"	L-ch level input signal.
79	P02	I	—	—		Not used.
80	P03	I	—	—		Not used.

CASSETTE DECK SECTION



CASSETTE DECK SECTION

PRINTED WIRING BOARD

1

2

3

4

5

6

7

8

CASSETTE DECK ASS'Y

Component Side

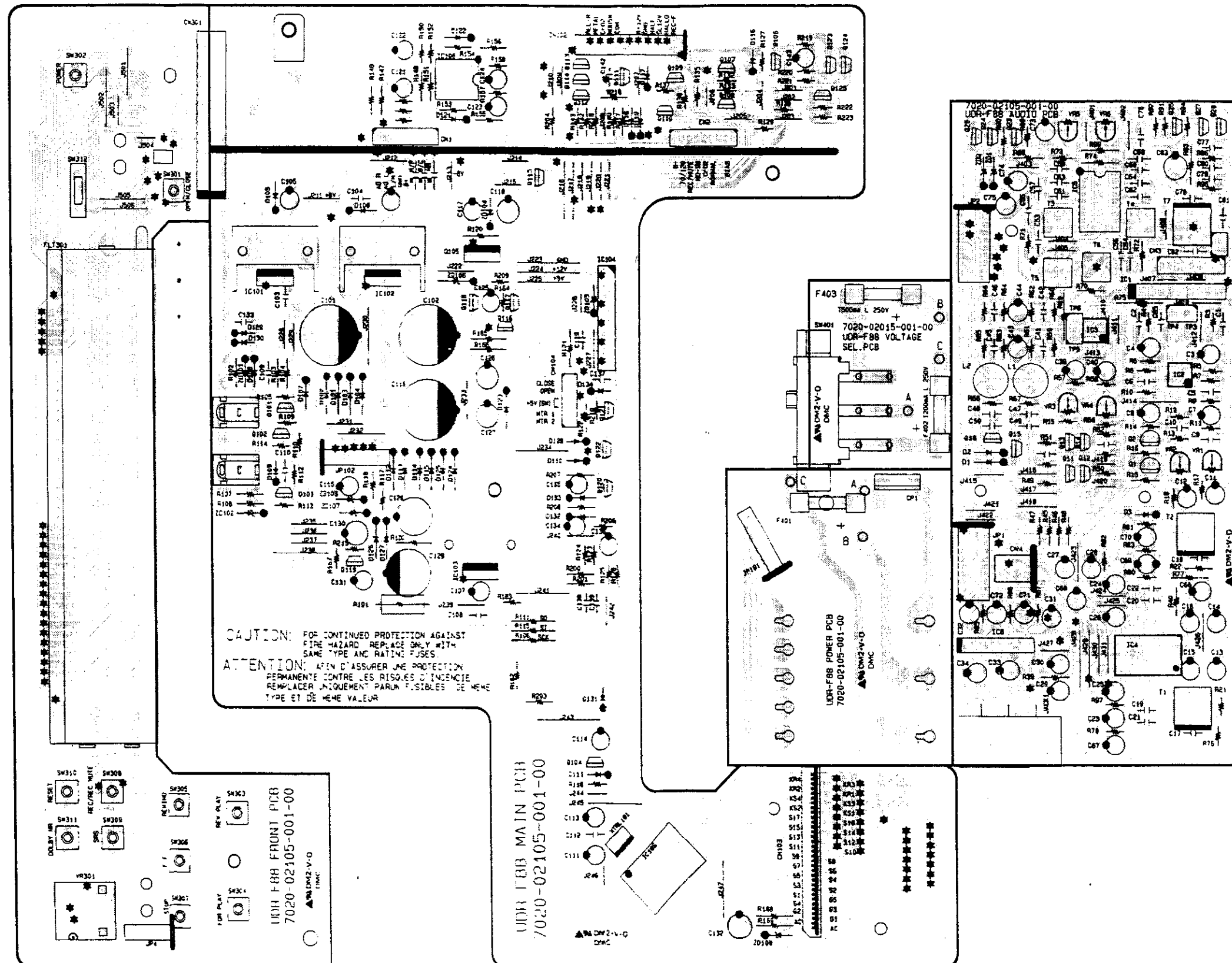
A

B

C

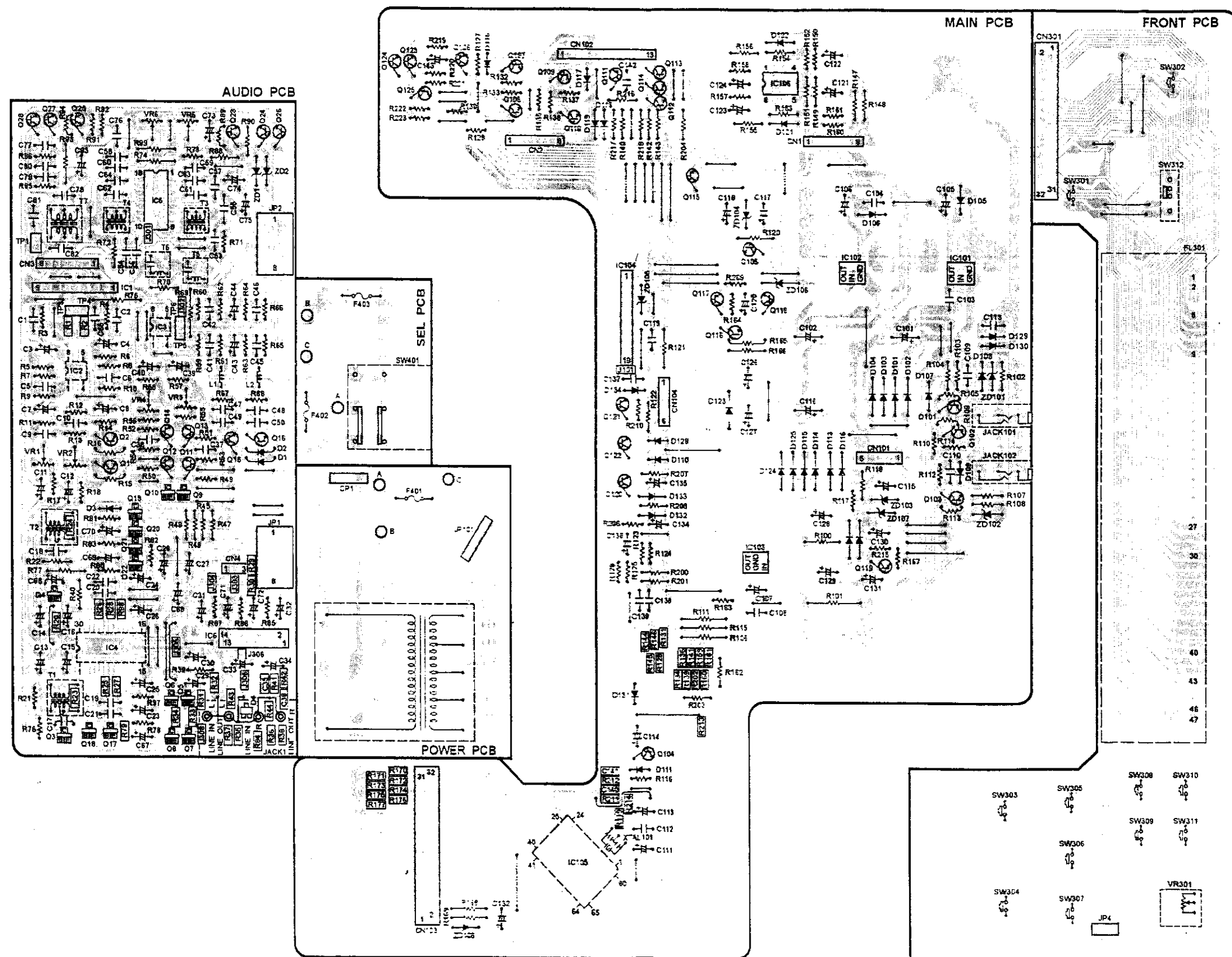
D

E



CASSETTE DECK SECTION

Pattern Side



CASSETTE DECK SECTION

NOTE FOR PARTS LIST

- Part indicated with the mark "⊙" are not always in stock and possibly to take a long period of time for supplying or in some case supplying of part may be refused.
- When ordering of part, clearly indicate "I" and "I" (i) to avoid mis-supplying.
- Ordering part without stating its part number can not be supplied.
- Part indicated with the mark "★" is not illustrated in the exploded view.
- Not including Carbon Film $\pm 5\%$, 1/4W Type in the P.W.Board parts list. (Refer to the Schematic Diagram for those parts.)

WARNING:

Parts marked with this symbol Δ have critical characteristics.
Use ONLY replacement parts recommended by the manufacturer.

● Resistors

Ex.: RN 14K 2E 182 G ER
Type Shape Power Resist- Allowable Others
and per- ance error
formance

RD : Carbon	2B : 1/8W	F : $\pm 1\%$	P : Pulse-resistant type
RC : Composition	2E : 1/4W	G : $\pm 2\%$	NL : Low noise type
RS : Metal oxide film	2H : 1/2W	J : $\pm 5\%$	NB : Non-burning type
RW : Winding	3A : 1W	K : $\pm 10\%$	FR : Fuse-resistor
RN : Metal film	3D : 2W	M : $\pm 20\%$	F : Lead wire forming
RK : Metal mixture	3F : 3W		
	3H : 5W		

* Resistance

$\overline{1} \overline{8} \overline{2} \Rightarrow 1800 \text{ ohm} = 1.8 \text{ kohm}$
Indicates number of zeros after effective number.
2-digit effective number.

• Units: ohm

$\overline{1} \overline{R} \overline{2} \Rightarrow 1.2 \text{ ohm}$
1-digit effective number.
2-digit effective number, decimal point indicated by R.

• Units: ohm

● Capacitors

Ex.: CE 04W 1H 2R2 M BP
Type Shape Dielectric Capacity Allowable Others
and per- strength error
formance

CE : Aluminum foil electrolytic	0J : 6.3V	F : $\pm 1\%$	HS : High stability type
CA : Aluminum solid electrolytic	1A : 10V	G : $\pm 2\%$	BP : Non-polar type
CS : Tantalum electrolytic	1C : 16V	J : $\pm 5\%$	HR : Ripple-resistant type
CQ : Film	1E : 25V	K : $\pm 10\%$	DL : For charge and discharge
CK : Ceramic	1V : 35V	M : $\pm 20\%$	HF : For assuring high frequency
CC : Ceramic	1H : 50V	Z : $\pm 50\%$	U : UL part
CP : Oil	2A : 100V	2 : $\pm 20\%$	C : CSA part
CM : Mica	2B : 125V	P : $\pm 100\%$	W : UL-CSA type
CF : Metallized	2C : 160V	3 : $\pm 5\%$	F : Lead wire forming
CH : Metallized	2D : 200V	D : $\pm 5\%$	
	2E : 250V	2 : $\pm 5\%$	
	2H : 500V	2 : $\pm 5\%$	
	2J : 530V	2 : $\pm 5\%$	

* Capacity (electrolyte only)

$\overline{2} \overline{2} \overline{2} \Rightarrow 2200 \mu\text{F}$
Indicates number of zeros after effective number.
2-digit effective number.

• Units: μF

$\overline{2} \overline{R} \overline{2} \Rightarrow 2.2 \mu\text{F}$
1-digit effective number.
2-digit effective number, decimal point indicated by R.

• Units: μF

* Capacity (except electrolyte)

$\overline{2} \overline{2} \overline{2} \Rightarrow 2200 \text{ pF} = 0.0022 \mu\text{F}$
(More than 2) — Indicates number of zeros after effective number.
2-digit effective number.

• Units: pF

$\overline{2} \overline{2} \overline{1} \Rightarrow 220 \text{ pF}$
(0 or 1) — Indicates number of zeros after effective number.
2-digit effective number.

• Units: pF

• When the dielectric strength is indicated in "AC" is included after the dielectric strength value.

PARTS LIST OF P.W.B. UNIT ASS'Y
CASSETTE DECK UNIT ASS'Y

Ref. No.	Part No.	Part Name	Remarks
SEMICONDUCTORS			
IC001	263 0590 001	IC $\mu\text{PC1330HA}$	Logic IC
IC002, 303	928 0035 809	IC NJM4565MD	Linear ope.amp
IC004	262 1267 903	IC CXA1331M	Dolby IC
IC005	263 0354 001	IC $\mu\text{PC1297CA}$	Dolby HX pro.
IC006	960 0014 109	IC M51132L	Linear equalizer
Δ IC101	263 0502 002	IC NJM7908FA	Regulator +8V
Δ IC102	263 0503 001	IC NJM7908FA	Regulator -8V
Δ IC103	9LC P024 12	IC KIA7806P	Regulator +6V
IC104	9L2 3017 01W	IC BA6209N	Linear driver/volume
IC105	960 0085 303	IC HD6433723E67F	CPU microprocessor
IC106	960 0013 100	IC NJM4565DD	Linear ope.amp
Q001, 102	274 0096 013	Transistor KTD1302	
Q003, 304	269 0088 906	Transistor DTC114TK	Built in resistor
Q005-010	269 0104 903	Transistor DTC343TK	Built in resistor
Q011-016	269 0074 907	Transistor DTC114TS	Built in resistor
Q017	269 0055 900	Transistor DTA144EK	Built in resistor
Q018, 119	269 0054 901	Transistor DTC144EK	Built in resistor
Q123	269 0020 906	Transistor DTC114ES	Built in resistor
Q124	273 0178 022	Transistor 2SC1740(R)	
Q125	960 0010 501	Transistor KTA1273(Y)	
Q020, 121	269 0055 900	Transistor DTA144EK	Built in resistor
Q022	269 0054 901	Transistor DTC144EK	Built in resistor
Q023, 124	269 0020 906	Transistor DTC114ES	Built in resistor
Q025	960 0010 501	Transistor KTA1273(Y)	
Q026	269 0040 009	Transistor DTC144ES	Built in resistor
Q027, 128	273 0178 022	Transistor 2SC1740S(R)	
Q101, 132	271 0192 002	Transistor 2SA933S(S)	
Q103	273 0178 022	Transistor 2SC1740S(R)	
Q104	269 0040 009	Transistor DTC144ES	Built in resistor
Q105	960 0004 902	Transistor KTD2058(Y)	
Q106	269 0040 009	Transistor DTC144ES	Built in resistor
Q107	960 0010 501	Transistor KTA1273(Y)	Built in resistor
Q108	269 0020 906	Transistor DTC114ES	Built in resistor
Q109	960 0010 501	Transistor KTA1273(Y)	Built in resistor
Q110	269 0020 906	Transistor DTC114ES	Built in resistor
Q111	269 0093 904	Transistor DTA144ES	Built in resistor
Q112-114	269 0040 009	Transistor DTC144ES	Built in resistor
Q115	269 0093 904	Transistor DTA144ES	Built in resistor
Q116	269 0040 009	Transistor DTC144ES	Built in resistor
Q117	269 0093 904	Transistor DTA144ES	Built in resistor
Q118	269 0040 009	Transistor DTC144ES	Built in resistor
Q119	960 0010 501	Transistor KTA1273(Y)	
Q120-122	269 0062 906	Transistor DTC124ES	Built in resistor
D001-103	960 0031 409	Diode 1SS131	
Δ D004	960 0014 206	Diode KDS226S	Bridge
Δ D101-104	916 0053 008	Diode 1N4002A	Rectifier

Ref. No.	Part No.	Part Name	Remarks
D105-113	960 0031 409	Diode 1SS131	
D114, 115	916 0053 008	Diode 1N4002A	
D116-119	960 0031 409	Diode 1SS131	
D121-123	960 0031 409	Diode 1SS131	
D124-127	916 0053 008	Diode 1N4002A	
D128-134	960 0031 409	Diode 1SS131	
ZD001, 002	960 0014 303	Zener diode MTZJ9.1B	9.1 V
ZD101, 102	9H3 0000 408	Zener diode MTZJ6.2B	6.2 V
ZD103	9H3 0000 251	Zener diode MTZJ5.6B	5.6 V
ZD104	9H3 0000 409	Zener diode MTZJ12B	12 V
ZD105	LA8 00-0 007	Zener diode MTZJ7.5B	7.5 V
ZD106	960 0013 401	Zener diode MTZJ3.9B	3.9 V
ZD107	960 0014 905	Zener diode MTZJ20B	20 V
ZD108	9H3 0000 408	Zener diode MTZJ6.2B	6.2 V
RESISTORS			
VR001, 002	960 0039 113	Semi fixed resistor 47 kohm	C54447301511 P.B.GAIN
VR003, 004	960 0039 100	Semi fixed resistor 22 kohm	C54422301511 LEVEL
VR005, 006	960 0039 113	Semi fixed resistor 47 kohm	C54447301511 BIAS
VR301	960 0011 704	Variable resistor 100 kohm	C45211140040
J146	247 1018 904	Carbon chip 0 ohm 1/8W	RM73B2B0R0K
R001, 002	247 0002 966	Carbon chip 10 ohm 1/10W	RM73B--100J
R003, 004	241 2403 950	Carbon film 120 kohm 1/6W	RD14B2E124J(5)
R005, 006	241 2396 960	Carbon film 150 ohm 1/6W	RD14B2E151J(5)
R007, 008	241 2401 981	Carbon film 24 kohm 1/6W	RD14B2E243J(5)
R009, 010	241 2405 026	Carbon film 620 kohm 1/6W	RD14B2E624J(5)
R011, 012	241 2399 970	Carbon film 3.3 kohm 1/6W	RD14B2E332J(5)
R013, 014	241 2400 911	Carbon film 4.7 kohm 1/6W	RD14B2E472J(5)
R015, 016	241 2400 953	Carbon film 6.8 kohm 1/6W	RD14B2E682J(5)
R017, 018	241 2403 934	Carbon film 100 kohm 1/6W	RD14B2E104J(5)
R019, 020	247 0009 956	Carbon chip 7.5 kohm 1/10W	RM73B--752J
R021, 022	241 2399 970	Carbon film 3.3 kohm 1/6W	RD14B2E332J(5)
R023, 024	247 0009 943	Carbon chip 6.8 kohm 1/10W	RM73B--682J
R025, 026	960 0039 401	Carbon chip 24 kohm 1/10W	RM73B--243F $\pm 1\%$
R027, 028	247 0006 988	Carbon chip 560 ohm 1/10W	RM73B--561J
R029, 030	247 0011 944	Carbon chip 47 kohm 1/10W	RM73B--473J
R031, 032	247 0008 902	Carbon chip 1.8 kohm 1/10W	RM73B--182J
R033, 034	247 0007 945	Carbon chip 1 kohm 1/10W	RM73B--102J
R035, 036	247 0009 985	Carbon chip 10 kohm 1/10W	RM73B--103J
R037, 038	247 0008 928	Carbon chip 2.2 kohm 1/10W	RM73B--222J
R039, 040	241 2401 981	Carbon film 24 kohm 1/6W	RD14B2E243J(5)
R041, 042	247 0011 999	Carbon chip 75 kohm 1/10W	RM73B--753J
R043, 044	247 0006 962	Carbon chip 470 ohm 1/10W	RM73B--471J
R045, 046	241 2402 951	Carbon film 47 kohm 1/6W	RD14B2E473J(5)
R047, 048	241 2401 978	Carbon film 22 kohm 1/6W	RD14B2E223J(5)
R049, 050	241 2402 977	Carbon film 56 kohm 1/6W	RD14B2E563J(5)

CASSETTE DECK SECTION

Ref. No.	Part No.	Part Name	Remarks	Ref. No.	Part No.	Part Name	Remarks
R051,052	241 2401 059	Carbon film 18 kohm 1/6W	RD14B2E183J(5)	R125	241 2399 970	Carbon film 3.3 kohm 1/6W	RD14B2E332J(5)
R055,056	241 2399 938	Carbon film 2.2 kohm 1/6W	RD14B2E222J(5)	R126	241 2398 955	Carbon film 1 kohm 1/6W	RD14B2E102J(5)
R057,058	241 2401 978	Carbon film 22 kohm 1/6W	RD14B2E223J(5)	R127	241 2403 934	Carbon film 100 kohm 1/6W	RD14B2E104J(5)
R059,060	241 2404 917	Carbon film 220 kohm 1/6W	RD14B2E224J(5)	R128	247 0007 945	Carbon chip 1 kohm 1/10W	RM73B--102J
R061,062	241 2402 003	Carbon film 30 kohm 1/6W	RD14B2E303J(5)	R129	241 2400 995	Carbon film 10 kohm 1/6W	RD14B2E103J(5)
R063,064	241 2399 064	Carbon film 3 kohm 1/6W	RD14B2E302J(5)	R130	241 2403 934	Carbon film 100 kohm 1/6W	RD14B2E104J(5)
R065,066	241 2398 939	Carbon film 820 ohm 1/6W	RD14B2E821J(5)	R131	247 0007 945	Carbon chip 1 kohm 1/10W	RM73B--102J
R067,068	241 2401 978	Carbon film 22 kohm 1/6W	RD14B2E223J(5)	R134	247 0007 945	Carbon chip 1 kohm 1/10W	RM73B--102J
R069,070	241 2400 063	Carbon film 7.5 kohm 1/6W	RD14B2E752J(5)	R135	241 2403 934	Carbon film 100 kohm 1/6W	RD14B2E104J(5)
R071,072	241 2403 073	Carbon film 150 kohm 1/6W	RD14B2E154J(5)	R136	247 0007 945	Carbon chip 1 kohm 1/10W	RM73B--102J
R073,074	241 2401 978	Carbon film 22 kohm 1/6W	RD14B2E223J(5)	R137,138	241 2397 943	Carbon film 330 ohm 1/6W	RD14B2E331J(5)
R075	241 2398 955	Carbon film 1 kohm 1/6W	RD14B2E102J(5)	R139	247 0007 945	Carbon chip 1 kohm 1/10W	RM73B--102J
R076	241 2403 934	Carbon film 100 kohm 1/6W	RD14B2E104J(5)	R140	241 2398 955	Carbon film 1 kohm 1/6W	RD14B2E102J(5)
R077	241 2400 995	Carbon film 10 kohm 1/6W	RD14B2E103J(5)	R141	247 0007 945	Carbon chip 1 kohm 1/10W	RM73B--102J
R078	241 2402 951	Carbon film 47 kohm 1/6W	RD14B2E473J(5)	R142,143	241 2398 955	Carbon film 1 kohm 1/6W	RD14B2E102J(5)
R079	247 0009 985	Carbon chip 10 kohm 1/10W	RM73B--103J	R144--146	247 0007 945	Carbon chip 1 kohm 1/10W	RM73B--102J
R080	241 2403 934	Carbon film 100 kohm 1/6W	RD14B2E104J(5)	R147,148	241 2398 955	Carbon film 1 kohm 1/6W	RD14B2E102J(5)
R081	241 2401 978	Carbon film 22 kohm 1/6W	RD14B2E223J(5)	R149,150	241 2402 951	Carbon film 47 kohm 1/6W	RD14B2E473J(5)
R082	241 2400 995	Carbon film 10 kohm 1/6W	RD14B2E103J(5)	R151,152	241 2401 981	Carbon film 24 kohm 1/6W	RD14B2E243J(5)
R083	241 2401 978	Carbon film 22 kohm 1/6W	RD14B2E223J(5)	R153,154	241 2401 978	Carbon film 22 kohm 1/6W	RD14B2E223J(5)
R084	247 0007 945	Carbon chip 1 kohm 1/10W	RM73B--102J	R155,156	241 2396 928	Carbon film 100 ohm 1/6W	RD14B2E101J(5)
R085	241 2402 951	Carbon film 47 kohm 1/6W	RD14B2E473J(5)	R157,158	241 2403 934	Carbon film 100 kohm 1/6W	RD14B2E104J(5)
R086,087	241 2402 935	Carbon film 39 kohm 1/6W	RD14B2E393J(5)	R159--161	247 0007 945	Carbon chip 1 kohm 1/10W	RM73B--102J
R088	241 2398 997	Carbon film 1.5 kohm 1/6W	RD14B2E152J(5)	R162	241 2398 955	Carbon film 1 kohm 1/6W	RD14B2E102J(5)
R089	241 2399 970	Carbon film 3.3 kohm 1/6W	RD14B2E332J(5)	R163	241 2402 951	Carbon film 47 kohm 1/6W	RD14B2E473J(5)
R090	241 2398 971	Carbon film 1.2 kohm 1/6W	RD14B2E122J(5)	R164	241 2403 934	Carbon film 100 kohm 1/6W	RD14B2E104J(5)
R091	241 2400 995	Carbon film 10 kohm 1/6W	RD14B2E103J(5)	R165	241 2400 995	Carbon film 10 kohm 1/6W	RD14B2E103J(5)
R092	241 2400 911	Carbon film 4.7 kohm 1/6W	RD14B2E472J(5)	R166	241 2396 928	Carbon film 100 ohm 1/6W	RD14B2E101J(5)
R093	241 2394 069	Carbon film 22 ohm 1/4W	RD14B2E220J	R167	241 2400 995	Carbon film 10 kohm 1/6W	RD14B2E103J(5)
R094	241 2395 945	Carbon film 47 ohm 1/6W	RD14B2E470J(5)	R168,169	241 2396 928	Carbon film 100 ohm 1/4W	RD14B2E101J
R095,096	241 2401 936	Carbon film 15 kohm 1/6W	RD14B2E153J(5)	R170--177	241 2402 951	Carbon film 47 kohm 1/6W	RD14B2E473J(5)
R097	241 2401 994	Carbon film 27 kohm 1/6W	RD14B2E273J(5)				
R098	247 0007 945	Carbon chip 1 kohm 1/10W	RM73B--102J				
Δ R101	244 2022 039	Fusible 22 ohm 1/4W(NB)	RD14B2E220JFR	R200,201	241 2403 934	Carbon film 100 kohm 1/6W	RD14B2E104J(5)
R102	241 2396 928	Carbon film 100 ohm 1/6W	RD14B2E101J(5)	R202	247 0007 945	Carbon chip 1 kohm 1/10W	RM73B--102J
R103	241 2401 978	Carbon film 22 kohm 1/6W	RD14B2E223J(5)	R203,204	241 2403 934	Carbon film 100 kohm 1/6W	RD14B2E104J(5)
R104	241 2398 955	Carbon film 1 kohm 1/6W	RD14B2E102J(5)	R206	241 2400 911	Carbon film 4.7 kohm 1/6W	RD14B2E472J(5)
R105	241 2401 978	Carbon film 22 kohm 1/6W	RD14B2E223J(5)	R207,208	241 2400 995	Carbon film 10 kohm 1/6W	RD14B2E103J(5)
R106	247 0007 945	Carbon chip 1 kohm 1/10W	RM73B--102J	R209	241 2398 955	Carbon film 1 kohm 1/6W	RD14B2E102J(5)
R107	241 2397 901	Carbon film 220 ohm 1/6W	RD14B2E221J(5)	R211,212	247 0011 944	Carbon chip 47 kohm 1/10W	RM73B--473J
R108	241 2402 951	Carbon film 47 kohm 1/6W	RD14B2E473J(5)	R213,214	241 2398 955	Carbon film 1 kohm 1/6W	RD14B2E102J(5)
R109,110	241 2400 995	Carbon film 10 kohm 1/6W	RD14B2E103J(5)	R215	241 2396 928	Carbon film 100 ohm 1/6W	RD14B2E101J(5)
R111	247 0007 945	Carbon chip 1 kohm 1/10W	RM73B--102J	R216--218	241 2398 955	Carbon film 1 kohm 1/6W	RD14B2E102J(5)
R112--114	241 2400 995	Carbon film 10 kohm 1/6W	RD14B2E103J(5)				
R115	247 0007 945	Carbon chip 1 kohm 1/10W	RM73B--102J	J101	—	Carbon chip 0 ohm 1/8W	C 20000006130
R116	241 2400 995	Carbon film 10 kohm 1/6W	RD14B2E103J(5)	J301--308	—	Carbon chip 0 ohm 1/8W	C 20000006130
R117	241 2401 059	Carbon film 18 kohm 1/6W	RD14B2E183J(5)				
R118	241 2400 953	Carbon film 6.8 kohm 1/6W	RD14B2E682J(5)				
R119	247 0014 967	Carbon chip 1 Mohm 1/10W	RM73B--105J				
R120	241 2396 928	Carbon film 100 ohm 1/4W	RD14B2E101J				
R121	241 2393 989	Carbon film 10 ohm 1/4W	RD14B2E100J				
R122--124	241 2398 955	Carbon film 1 kohm 1/6W	RD14B2E102J(5)				

CAPACITORS			
C001,002	253 1055 014	Ceramic cap. 560 pF/50V	CK45B1H561K
C003,004	254 4254 019	Electrolytic 22 μF/16V	CE04W1C220M
C005,006	255 1120 097	Film cap. 5600 pF/50V	CQ93M1H562J
C007,008	254 4260 045	Electrolytic 1 μF/50V	CE04W1H010M

CASSETTE DECK SECTION

Ref. No.	Part No.	Part Name	Remarks
C009,010	255 1121 041	Film cap. 0.015 μ F/50V	CQ93M1H153J
C011-016	254 4260 045	Electrolytic 1 μ F/50V	CE04W1H010M
C017,018	255 1120 055	Film cap. 2700 pF/50V	CQ93M1H272J
C019-022	255 1120 042	Film cap. 2200 pF/50V	CQ93M1H222J
C023,024	254 4260 032	Electrolytic 0.47 μ F/50V	CE04W1HR47M
C025,026	254 4260 029	Electrolytic 0.33 μ F/50V	CE04W1HR33M
C027-030	254 4260 058	Electrolytic 2.2 μ F/50V	CE04W1H2R2M
C031-034	254 4260 074	Electrolytic 4.7 μ F/50V	CE04W1H4R7M
C035,036	257 0016 904	Ceramic chip. 100 pF/50V	CC73CH1H101J(Temp.)
C039,040	254 4260 074	Electrolytic 4.7 μ F/50V	CE04W1H4R7M
C041,042	255 1122 037	Film cap. 0.082 μ F/50V	CQ93M1H823J
C043,044	254 4252 024	Electrolytic 47 μ F/10V	CE04W1A470M
C045,046	255 1134 012	Film cap. 5600 pF/50V	CQ92M1H562J
C047,048	255 1135 053	Film cap. 3900 pF/50V	CQ92M1H392J
C049,050	255 1134 009	Film cap. 2200 pF/50V	CQ92M1H222J
C053,054	253 1055 069	Ceramic cap. 100 pF/50V	CK45B1H101K
C055,056	960 9001 401	Film cap. 300 pF/100V	CQ93P2A301J
C057,058	253 1055 027	Ceramic cap. 820 pF/50V	CK45B1H821K
C059,060	255 1121 025	Film cap. 0.01 μ F/50V	CQ93M1H103J
C061,062	255 1121 083	Film cap. 0.033 μ F/50V	CQ93M1H333J
C063,064	255 1121 067	Film cap. 0.022 μ F/50V	CQ93M1H223J
C065	253 1010 004	Ceramic cap. 0.01 μ F/50V	CK45B1H103K
C066	254 4254 019	Electrolytic 22 μ F/16V	CE04W1C220M
C067	254 4260 045	Electrolytic 1 μ F/50V	CE04W1H010M
C068,069	254 4256 004	Electrolytic 10 μ F/25V	CE04W1E100M
C070	254 4260 058	Electrolytic 2.2 μ F/50V	CE04W1H2R2M
C071	254 4260 045	Electrolytic 1 μ F/50V	CE04W1H010M
C072	254 4254 019	Electrolytic 22 μ F/16V	CE04W1C220M
C073	254 4256 004	Electrolytic 10 μ F/25V	CE04W1E100M
C074	254 4254 019	Electrolytic 22 μ F/16V	CE04W1C220M
C075	254 4256 004	Electrolytic 10 μ F/25V	CE04W1E100M
C076	253 1026 001	Ceramic cap. 0.047 μ F/50V	CK45F1H473Z
C077	255 1120 042	Film cap. 2200 pF/50V	CQ93M1H222J
C078	255 1121 041	Film cap. 0.015 μ F/50V	CQ93M1H153J
C079,080	255 1120 068	Film cap. 3300 pF/50V	CQ93M1H332J
C081	255 4079 925	Film cap. 8200 pF/100V	CQ93P2A822J
C082	253 4342 012	Ceramic cap. 10 pF/50V	CC45SL1H100J
C083	254 4254 051	Electrolytic 220 μ F/16V	CE04W1C221M
C101,102	254 4256 091	Electrolytic 2200 μ F/25V	CE04W1E222M
C103,104	253 1010 004	Ceramic cap. 0.01 μ F/50V	CK45B1H103K
C105-107	254 4256 004	Electrolytic 10 μ F/25V	CE04W1E100M
C108	253 1010 004	Ceramic cap. 0.01 μ F/50V	CK45B1H103K
C109,110	253 1004 007	Ceramic cap. 1000 pF/50V	CK45B1H102K
C111	254 4252 037	Electrolytic 100 μ F/10V	CE04W1A101M
C112	253 1010 004	Ceramic cap. 0.01 μ F/50V	CK45B1H103K
C113	254 4260 058	Electrolytic 2.2 μ F/50V	CE04W1H2R2M
C114	254 4260 045	Electrolytic 1 μ F/50V	CE04W1H010M
C115	254 4260 061	Electrolytic 3.3 μ F/50V	CE04W1H3R3M
C116	254 4256 091	Electrolytic 2200 μ F/25V	CE04W1E222M
C117	254 4260 061	Electrolytic 3.3 μ F/50V	CE04W1H3R3M
C118	254 4254 048	Electrolytic 100 μ F/16V	CE04W1C101M

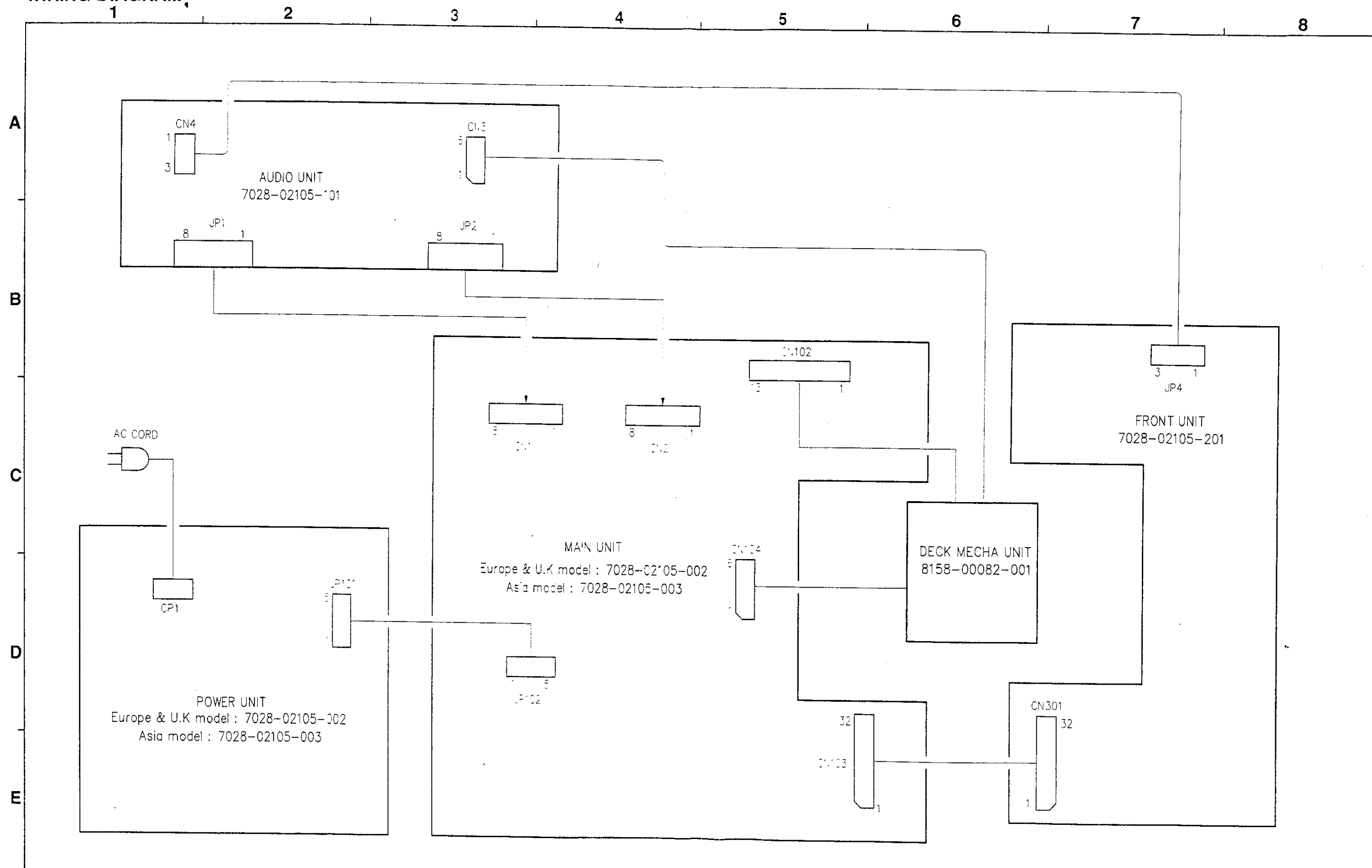
Ref. No.	Part No.	Part Name	Remarks	
C119,120	253 1027 000	Ceramic cap. 0.1 μ F/50V	CK45F1H104Z	
C121,122	254 4260 058	Electrolytic 2.2 μ F/50V	CE04W1H2R2M	
C123,124	254 4260 032	Electrolytic 0.47 μ F/50V	CE04W1HR47M	
C125	254 4260 906	Electrolytic 0.1 μ F/50V	CE04W1H0R1M	
C126,127	254 4256 046	Electrolytic 100 μ F/25V	CE04W1E101M	
C128	254 4256 062	Electrolytic 330 μ F/25V	CE04W1E331M	
C129	254 4261 044	Electrolytic 330 μ F/50V	CE04W1H331M	
C130	254 4258 044	Electrolytic 47 μ F/35V	CE04W1V470M	
C131	254 4256 004	Electrolytic 10 μ F/25V	CE04W1E100M	
C132	254 4260 045	Electrolytic 1 μ F/50V	CE04W1H010M	
C133	253 1010 004	Ceramic cap. 0.01 μ F/50V	CK45B1H103K	
C134	254 4260 045	Electrolytic 1 μ F/50V	CE04W1H010M	
C135	254 4254 035	Electrolytic 47 μ F/16V	CE04W1C470M	
C136	254 4256 004	Electrolytic 10 μ F/25V	CE04W1E100M	
C137	253 1025 002	Ceramic cap. 0.022 μ F/50V	CK45F1H223Z	
C138,139	253 1010 004	Ceramic cap. 0.01 μ F/50V	CK45B1H103K	
C140,141	257 0009 966	Ceramic chip. 4700 pF/50V	CK73B1H472K	
C142	253 1010 004	Ceramic cap. 0.01 μ F/50V	CK45B1H103K	
C143	254 4252 037	Electrolytic 100 μ F/10V	CE04W1A101M	
OTHER PARTS				Q'ty
	—	(P.W.board)	—	(1)
JACK001	960 0014 002	4 P pin jack	G60204004504	1
JACK101,102	960 0004 407	Mini jack ϕ 3.5	G40103110201	2
L001,002	960 0013 618	Inductor 18 mH	D33018000000	2
SW301-311	960 0002 409	Tact switch	G18000027000	11
SW312	960 0011 801	Slide switch	G06031301201	1
Δ SW401	960 0037 403	Slide switch (Voltage sel.sw)	G06000100001	1
			Asia model only	
T001,002	960 0013 906	MPX filter	E40125366001	2
T003,004	960 0013 702	Osc. transformer	D94052400000	2
T005,006	960 0013 605	Trap coil	D30212652240	2
T007	960 0013 809	Osc. bias transformer	E08051690000	1
FLT301	393 8014 000	FLD tube BJ-239GK	K53000028001	1
Δ F401	960 0038 800	Fuse T0.2A 250V	G65020125104	1
			Europe model	
Δ F402	960 0038 800	Fuse T0.2A 250V	G65020125104	1
			Asia model	
Δ F403	960 0038 907	Fuse T0.5A 250V	G65050125104	1
			Asia model	
	960 0005 804	Fuse holder	for F401	2
			Europe model	
	960 0005 804	Fuse holder	for F402,403	4
			Asia model	

CASSETTE DESK SECTION

Ref. No.	Part No.	Part Name	Remarks	Q'ty
XTAL101	399 0107 007	Ceramic resonator	CST4.19MGW	1
CN001,002	---	Connector wafer 8 P	L10120080001	2
CN003	---	Connector wafer 8 P	L10153014081	1
CN004	---	Connector wafer 3 P	L13206031001	1
CN101	---	Cable holder 5 P	L11251052050	1
CN102	---	Wire trap 13 P	L14152147131	1
CN103	960 0039 207	Flat cable 32 P Holder	L13152044320	1
CN103	960 0013 207	Flat cable 32 P Connector	L13152045320	1
CN104	---	Connector wafer 6 P	L10153014061	1
CN301	960 0011 908	32 P flat cable	L30115132001	1
Δ CP001	---	Connector wafer 2 P	L10803960201	1
JP001,002	---	Connector wafer 8 P	L10120080002	2
JP004	---	Cable holder 3 P	L11251052030	1
JP004	---	Flat cable 260 mm Black	L32026103260	1
JP101,102	---	Cable holder 5 P	L11251052050	2
JP101	---	Flat cable 200 mm Black	L32020105241	1
TP001	---	Connector wafer 2 P	L10153014021	1
TP003-006	---	Connector wafer 3 P	L10153014031	2
	---	Heat sink	for IC101~103	3
	960 0036 909	Terminal	379000012000	1
	960 0012 004	FLD support	407002002101	1
J201~247	---	Jumper wire	L40200002002	47
J401~431	---	Jumper wire	L40200002002	31
J501~506	---	Jumper wire		6
W1	---	1P Connector wire Black L=100 mm	L00010122001 Asia model only	1
W2	---	1P Connector wire Yellow L=100 mm	L00010122401 Asia model only	1
W3	---	1P Connector wire Blue L=120 mm	L00010122601 Asia model only	1

CASSETTE DECK SECTION

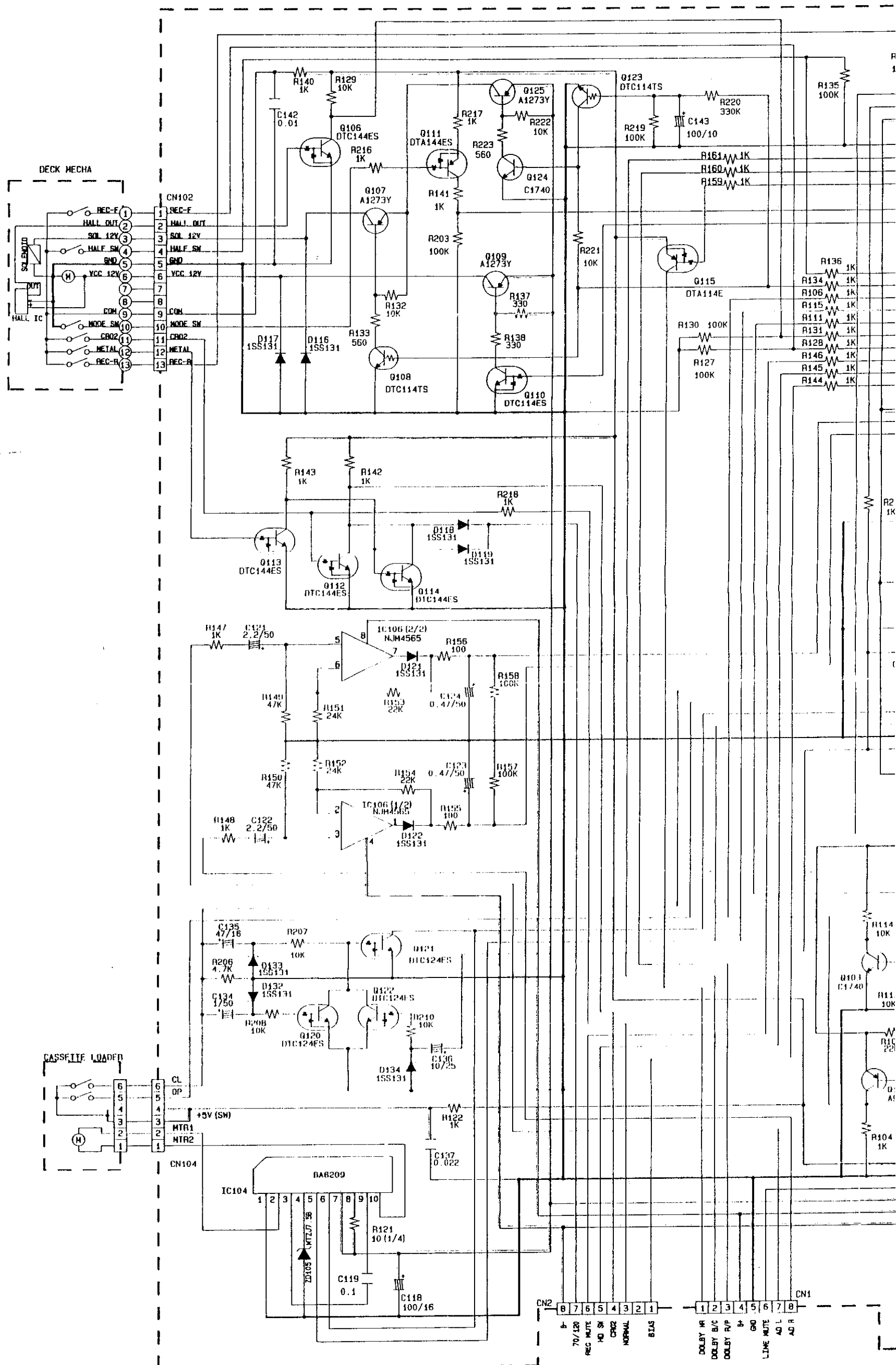
WIRING DIAGRAM

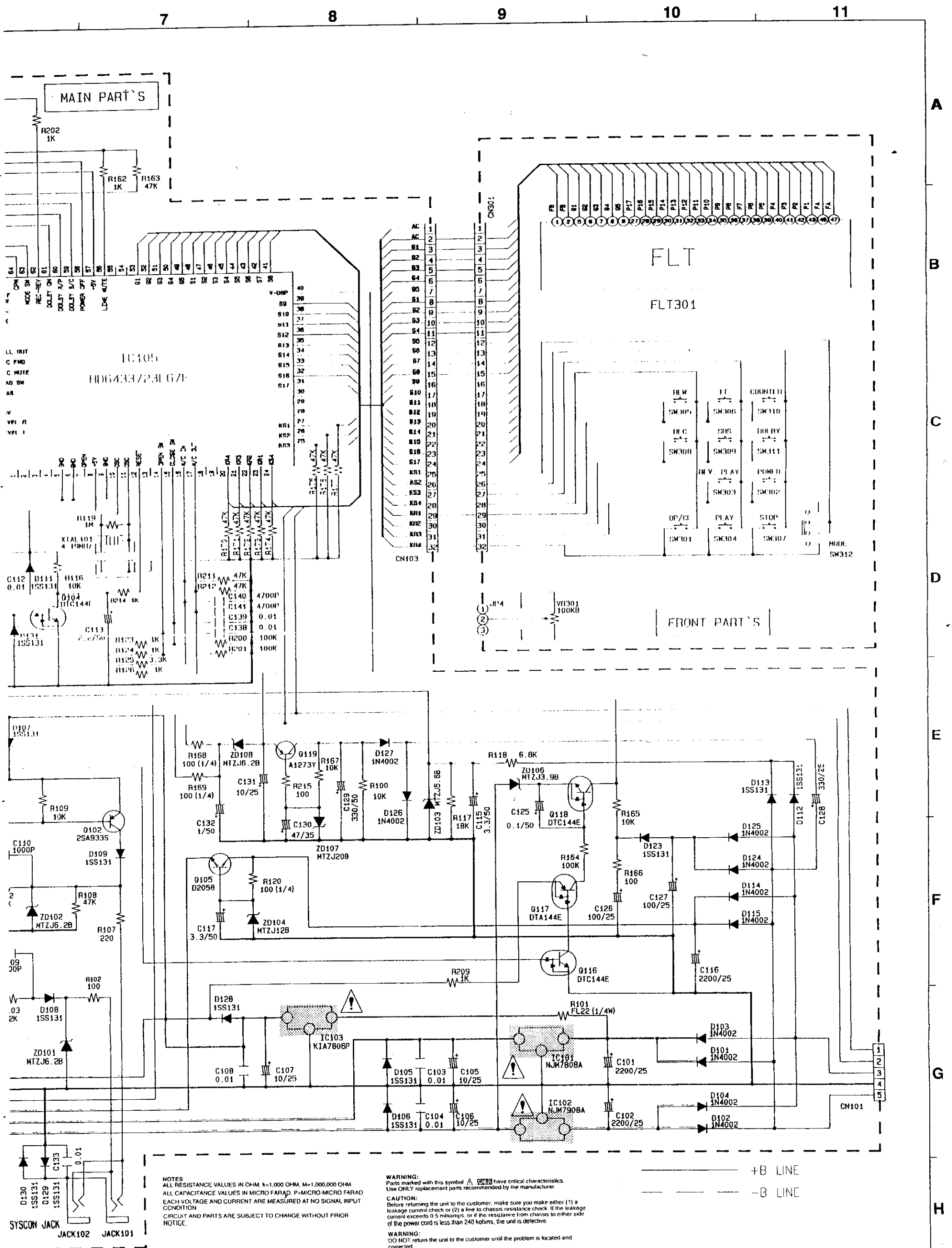


CAS
SCH SCHEMATIC DIAGRAM (1/2)

1 2 3 4 5

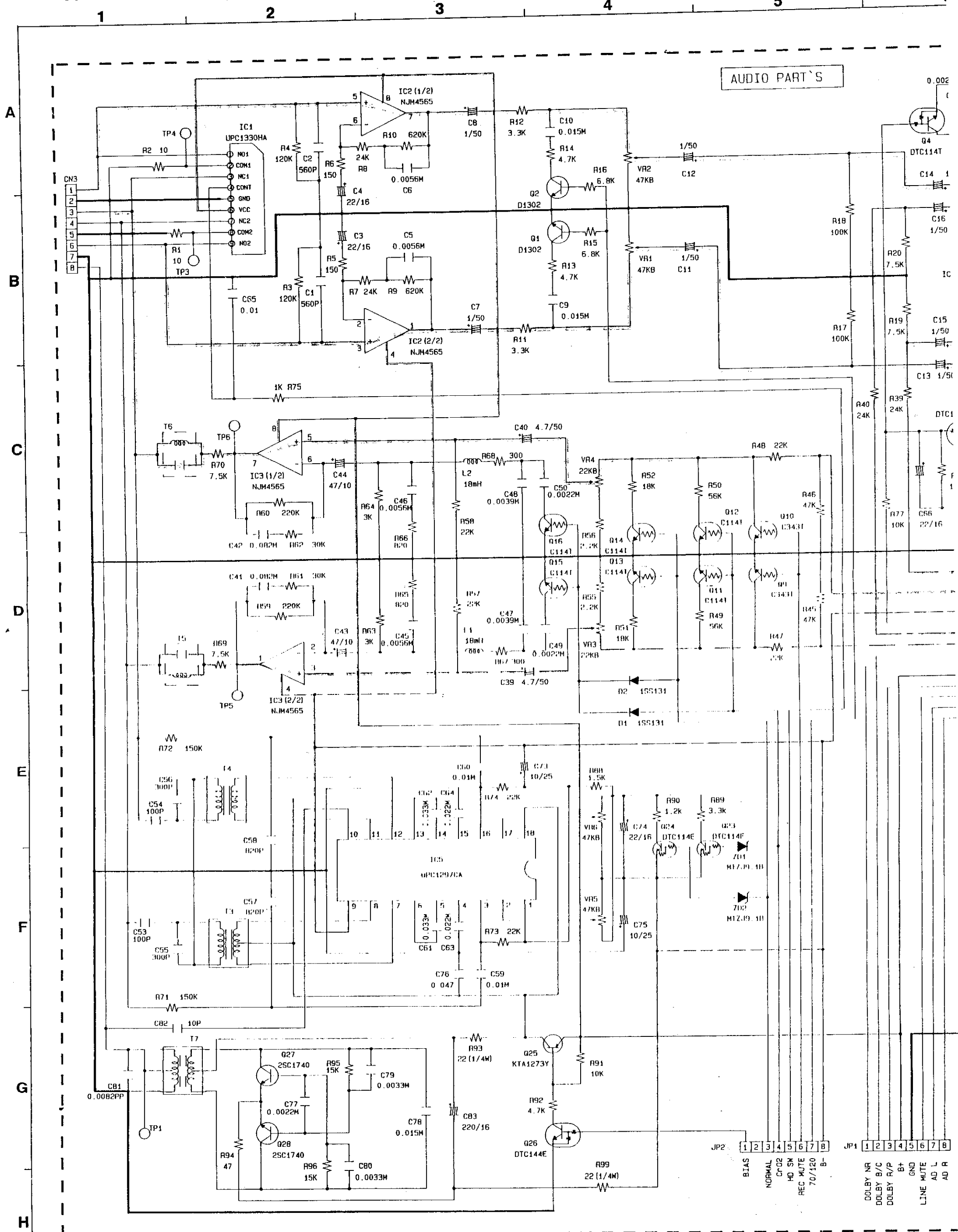
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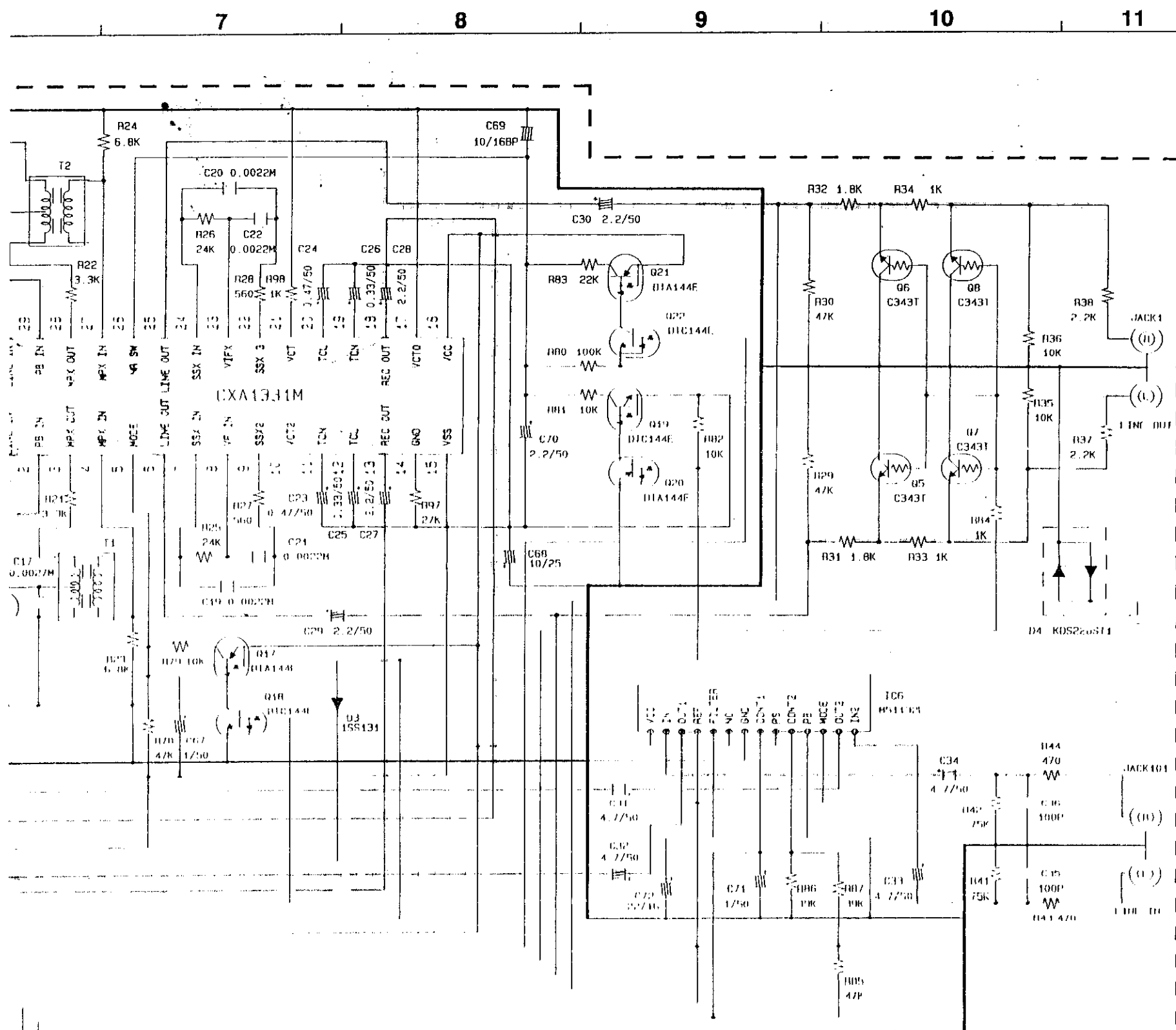




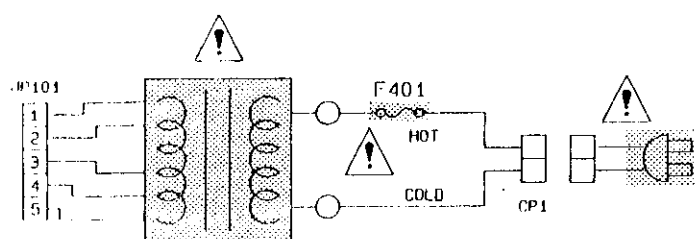
CASSETTE DECK SECTION

SCHEMATIC DIAGRAM (2/2)

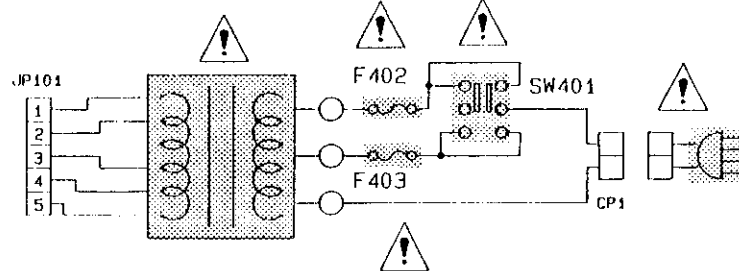




POWER PARTS



- * TRANS
J TYPE 100V 50, 60Hz
E2, FK TYPE 230V 50Hz
- * FUSE F401
J TYPE 125V T800mA
E2, FK TYPE 250V T200mA



- * TRANS
E1 TYPE 115, 230V / 50, 60Hz
- * FUSE F402 F403
E1 TYPE 250V T200mA 250V T500mA

NOTES
ALL RESISTANCE VALUES IN OHM, k=1,000 OHM, M=1,000,000 OHM
ALL CAPACITANCE VALUES IN MICRO FARAD, P=MICRO-MICRO FARAD
EACH VOLTAGE AND CURRENT ARE MEASURED AT NO SIGNAL INPUT CONDITION.
CIRCUIT AND PARTS ARE SUBJECT TO CHANGE WITHOUT PRIOR NOTICE.

WARNING:
Parts marked with this symbol have critical characteristics.
Use ONLY replacement parts recommended by the manufacturer.

CAUTION:
Before returning the unit to the customer, make sure you make either (1) a leakage current check or (2) a line to chassis resistance check. If the leakage current exceeds 0.5 milliamperes, or if the resistance from chassis to either side of the power cord is less than 240 kohms, the unit is defective.

WARNING:
DO NOT return the unit to the customer until the problem is located and corrected.

+B LINE

-B LINE

Lch SIGNAL LINE

Rch SIGNAL LINE

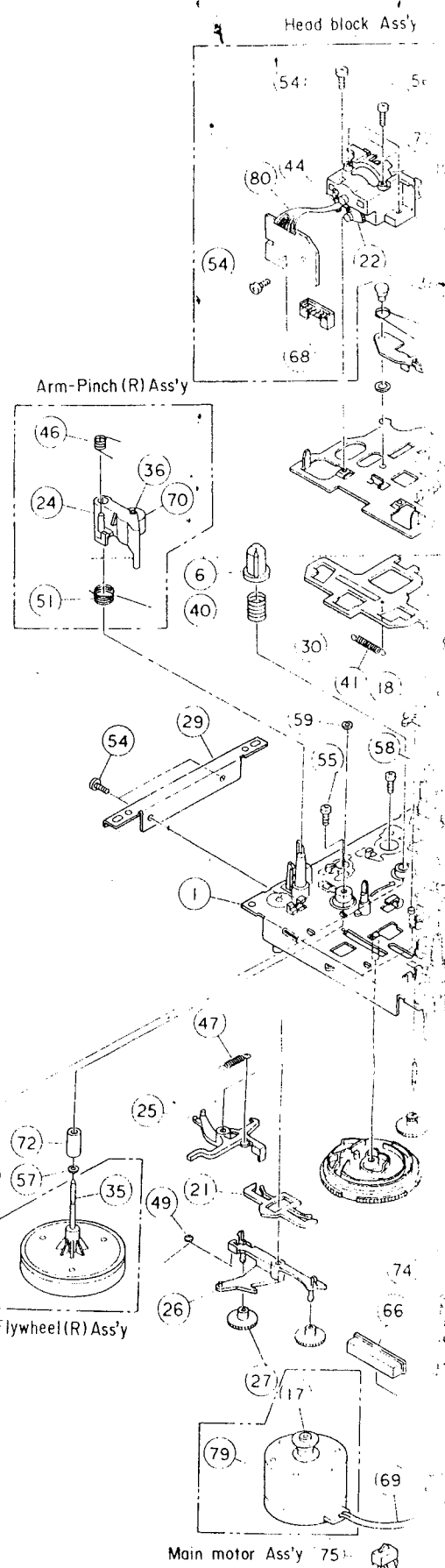
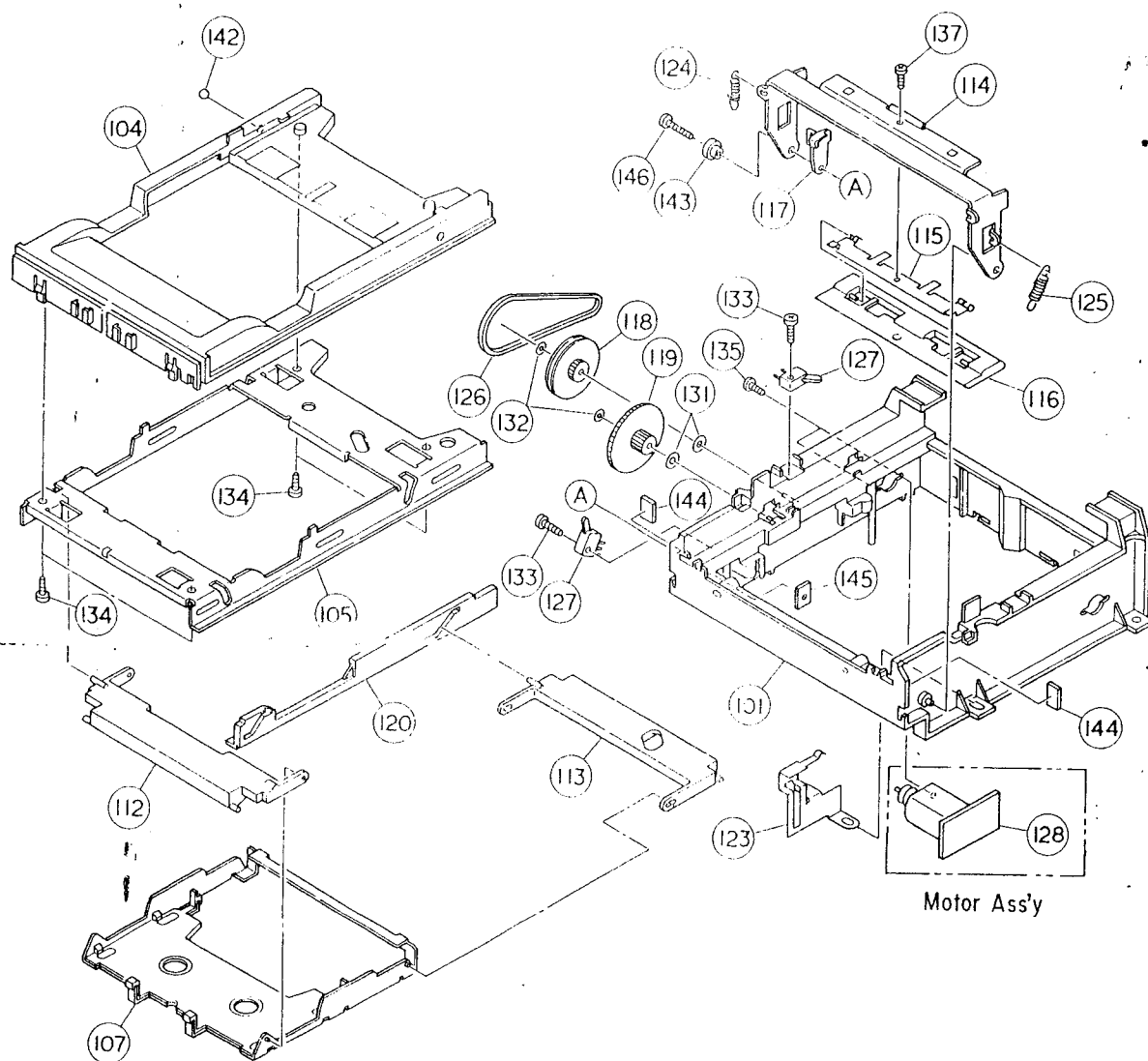
CASSETTE MECHANISM EXPLODED VIEW

PARTS I
CASSET

Ref. No.

LOADER SECTION

MECHA. SECTION

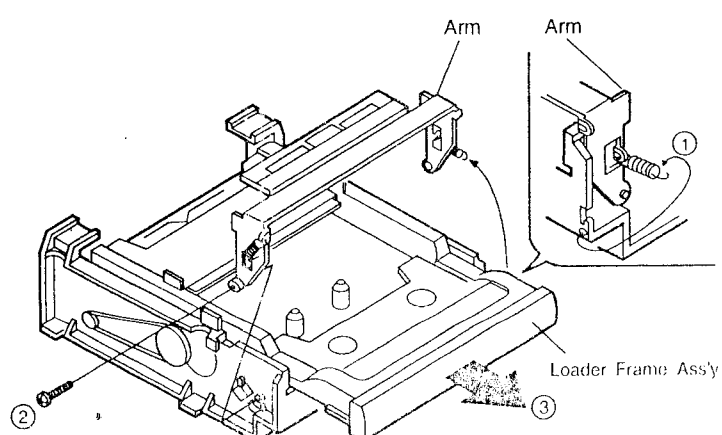


DISASSEMBLY PROCEDURES

(Assembly is performed in the reverse order.)

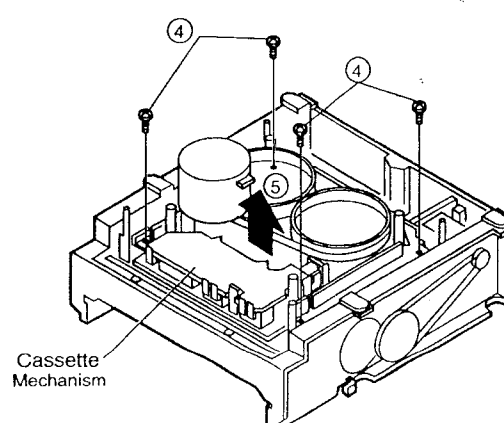
1. Loader Frame Ass'y

- ① Remove the Arm spring.
- ② Remove a screw fastening the Arm on the Loader Frame Ass'y.
- ③ Pull out the Loader Frame Ass'y as shown in figure.



2. Cassette Mechanism

- ④ Remove 4 screws fixing the Cassette Mechanism.
- ⑤ Detach the Cassette Mechanism in the arrow direction.



PARTS LIST OF CASSETTE MECHANISM UNIT (Part No.:960 0014 701) LOADER SECTION

Ref. No.	Part No.	Part Name	Remarks	Q'ty	Ref. No.	Part No.	Part Name	Remarks
101	960 0017 009	Frame Ass'y	A1A001A	1	125	960 0018 503	Spring B	A1S002B
102	—	—	—	—	126	960 0018 600	Belt	A1G011A
103	—	—	—	—	127	960 0018 707	Switch MSS-8B	S01W181
104	960 0017 106	Tray	A1G002A	1	128	960 0018 804	Motor P.W.board Ass'y	M01T147 w.c.
105	960 0017 203	Chassis	A1P001A	1	129	—	—	—
106	—	—	—	—	130	—	—	—
107	960 0017 300	Holder Ass'y	A1A002A	1	131	960 0018 901	Washer 2.1x4x0.5	P21W405
108	—	—	—	—	132	960 0018 914	Washer 2.1x4x0.5C	P21C405
109	—	—	—	—	133	960 0018 927	B lite screw 2x8 Black	N20B008
110	—	—	—	—	134	960 0018 930	B lite screw 2.6x5 Black	N26B005
111	—	—	—	—	135	960 0018 943	Screw 2x4	M20N004
112	960 0017 407	Arm A	A1G004A	1	136	—	—	—
113	960 0017 504	Arm C	A1G005A	1	137	960 0018 956	Screw 1.4x2 Black	S14N002
114	960 0017 601	Arm	A1P003A	1	138	—	—	—
115	960 0017 708	Retainer	A1P004A	1	139	—	—	—
116	960 0017 805	Plate	A1G006A	1	140	—	—	—
117	960 0017 902	Arm	A1G007A	1	141	—	—	—
118	960 0018 008	Pulley	A1G008A	1	142	960 0019 007	Steel ball f5	A1H006A
119	960 0018 105	Gear	A1G009A	1	143	960 0019 104	Bush	A1H002A
120	960 0018 202	Gear rack	A1G010A	1	144	960 0019 201	Buffer	A1G015A
121	—	—	—	—	145	960 0018 969	Nut	A1P007A
122	—	—	—	—	146	960 0018 972	Screw 1.7x10	S17N010
123	960 0018 309	Plate	A1P005A	1	147	—	—	—
124	960 0018 406	Spring A	A1S001A	1				

PARTS LIST OF CASSETTE MECHANISM UNIT MECH. SECTION

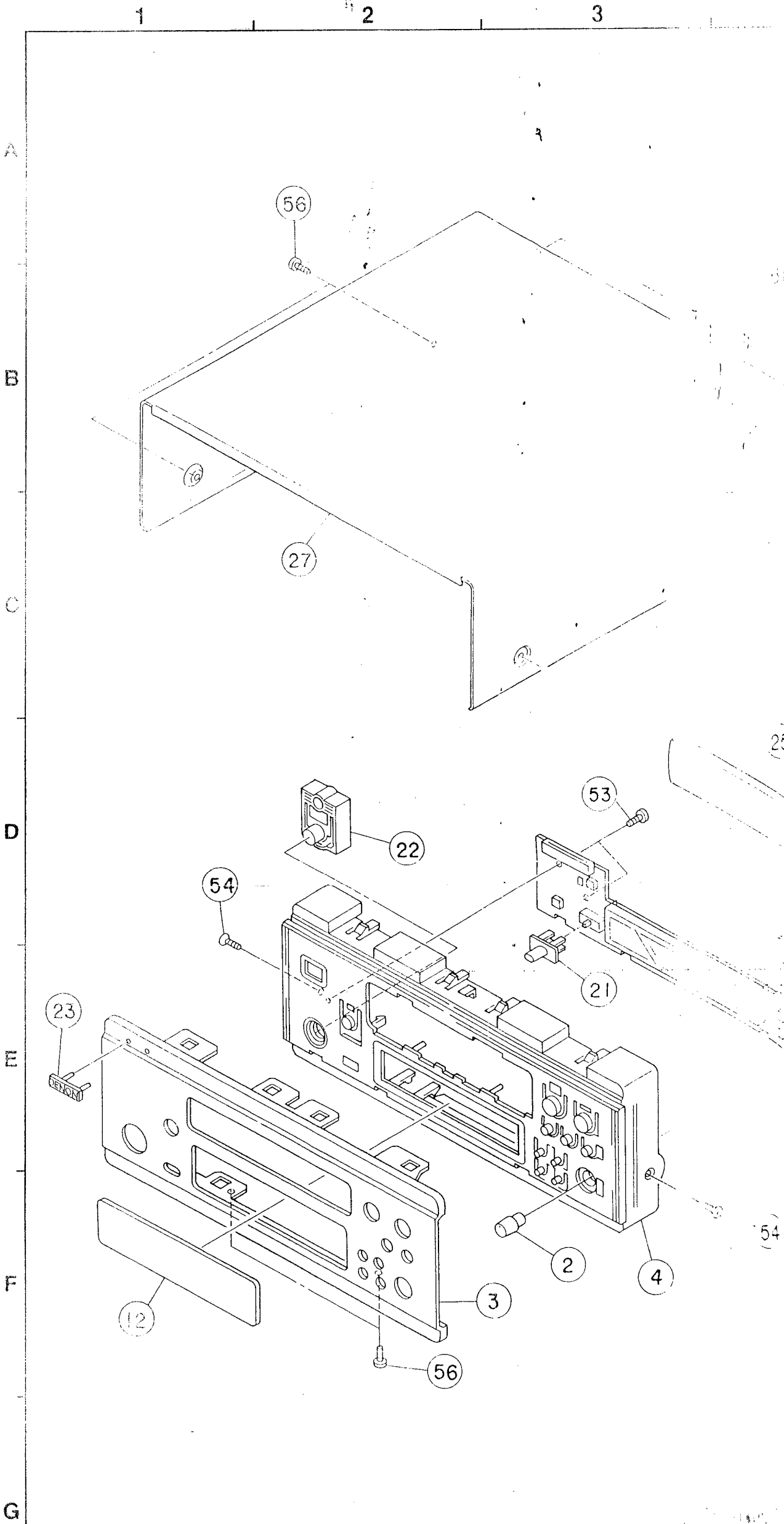
Ref. No.	Part No.	Part Name	Remarks	Q'ty	Ref. No.	Part No.	Part Name	Remarks
1	—	Main chassis	11112-00500BA	1	46	960 0023 967	Pinch spring R	51263-0805E
2	960 0020 106	Head base	11105-00310BA	1	47	960 0023 970	Cam lock spring	51211-0303E
3	960 0020 203	Sub. head base	11105-00420BA	1	48	960 0023 983	Spring C	51203-0614E
4	960 0020 300	Spring plate	51299-12316XA	1	49	960 0023 996	RF arm spring	51264-0303E
5	960 0020 407	Flywheel plate F	11143-00800BA	1	50	960 0024 005	Pinch return spring F	51263-0303E
6	960 0020 504	Reel chip	11110-00120AA	2	51	960 0024 018	Pinch return spring R	51263-0303E
7	960 0020 601	Reel base	11105-00330AA	1	52	960 0024 021	Sub. spring	51272-1007E
8	960 0020 708	Bush P	11107-00220AA	1	53	960 0024 102	Tapping screw 1.6x8	50032-1608E
9	960 0020 805	Head bracket	11106-00650AA	1	54	960 0024 115	Tapping screw 2x4	50262-2003E
10	960 0020 902	Head gear	11128-00740AA	1	55	960 0024 128	Pan screw 2.6x5	50032-2603E
11	960 0021 008	Cam gear	11128-00760AA	1	56	960 0024 131	Azimuth screw 2x5	—
12	960 0021 105	Idler gear	11128-00780AA	1	57	960 0024 209	Washer	51000-0230E
13	960 0021 202	Bush C	11107-00230AA	1	58	960 0024 212	Washer	51010-0180E
14	960 0021 309	Pulley C	11145-00560AA	1	59	960 0024 225	Washer	51010-0160E
15	960 0021 406	Flywheel pulley F	11145-00570AA	1	60	960 0024 238	Washer	51010-0090E
16	960 0021 503	Flywheel pulley R	11145-00580AA	1	61	960 0024 306	Felt P	51000-0230E
17	960 0021 600	Motor pulley	11145-00590AA	1	62	960 0024 319	Felt C	51010-0180E
18	960 0021 707	Arm P	11102-01020AA	1	63	960 0024 403	Sub. belt	51428-0341E
19	960 0021 804	Gear P	11128-00730AA	1	64	960 0024 500	Main belt	51428-0690E
20	960 0021 901	Cap P	11117-00090AA	1	65	960 0024 607	Control P.W.board	51000-0230E
21	960 0022 007	Brake lever	11102-01030AA	1	66	960 0024 704	Rec./Playback connector	70219-3000E
22	960 0022 104	DIR gear	11128-00750AA	1	67	—	—	—
23	960 0022 201	Pinch arm F	11102-01040AA	1	68	960 0024 720	Head connector	70219-3000E
24	960 0022 308	Pinch arm R	11102-01050AA	1	69	960 0024 801	Motor wire	70620-0160E
25	960 0022 405	Cam lock arm	11102-01060AA	1	70	960 0024 908	Pinch roller	11147-0010E
26	960 0022 502	RF arm	11102-01070AA	1	71	960 0025 004	Metal bearing A	51601-0220E
27	960 0022 609	RF gear	11128-00770AA	2	72	960 0025 017	Metal bearing B	51601-0201E
28	960 0022 706	Cap C	11117-00100AA	1	73	960 0025 101	Hall IC	69801-9900E
29	960 0022 803	Side bracket	11106-00970AA	2	74	960 0025 208	Detector switch	70016-0400E
30	960 0022 900	AC lever	11134-01870AA	1	75	960 0025 305	Mode switch	70066-0200E
31	960 0023 006	Magnet cap	11117-00120AA	1	76	960 0025 402	Solenoid	79840-0000E
32	960 0023 103	RF shaft	11150-02260EA	1	77	960 0025 509	Rec./Playback head	71486-9404E
33	960 0023 200	Idler shaft	11150-02270EA	1	78	—	—	—
34	960 0023 307	Capstan shaft F	11150-02290EA	1	79	960 0025 703	Motor	70620-0160E
35	960 0023 404	Capstan shaft R	11150-02300EA	1	80	—	Head wire	70620-0150E
36	960 0023 501	Pinch shaft	11150-00130EA	2	★ 81	—	Head wire	70620-0150E
37	—	—	—	—	★ 82	—	Head wire	70620-0150E
38	960 0023 705	Sub. shaft	11150-02810EA	1	★ 83	—	Head wire	70620-0150E
39	960 0023 802	Roller P	11147-01780EA	1	★ 84	—	Head wire	70620-0150E
40	960 0023 909	B/T spring	51203-03096XA	2	★ 85	—	Head wire	70620-0150E
41	960 0023 912	AC lever spring	51211-01026XA	1	★ 86	—	Head wire	70620-0150E
42	960 0023 925	Spring P	51203-05106XB	1	87	—	—	—
43	960 0023 938	Base head spring	51263-08046XA	1				
44	960 0023 941	DIR spring	51267-03036XA	1				
45	960 0023 954	Pinch spring F	51263-08056XA	1				

CASSETTE DECK SECTION

EXPLODED VIEW

PARTS LIST OF EXPLODED VIEW
CASSETTE DECK SECTION(UDR-F88)

Ref. No.	Part No.	Part Name	Remarks	Qty
1	—	Main P.W.B. unit	702802105000	1s
1-1	—	Main P.W.B. unit	Asia model	(1)
1-1	—	Main P.W.B. unit	Europe and U.K. model	(1)
1-2	—	Audio P.W.B. unit	702802105000	(1)
1-3	—	Front P.W.B. unit	702802105000	(1)
1-4	—	Voltage sel P.W.B. unit	Asia model	(1)
2	960 0084 702	Balance knob	508702002102	1
3	960 0084 003	Front panel	306702090801	1
4	960 0084 100	Inner panel	321702016101	1
5	960 0012 402	Motor cover	431002019601	1
6	960 0003 505	Foot cushion	405002007501	4
7	960 0003 408	Front foot	400700006101	2
8	960 0012 305	Mecha supporter	407002001101	4
9	960 0003 204	Rear foot	400000060101	2
10	960 0003 301	Supporter P.W.B.	407000160101	3
11	960 0012 208	Chassis	320002009601	1
12	960 0084 605	Window	507702039002	1
△	14 960 0032 301	AC Cord	L06100041601	1
△	15 960 0003 602	Cord bush	438000018000	1
16	960 0084 414	Rear panel	320702008612	1
16	960 0084 427	Rear panel	Asia model Europe and U.K. model	1
18	—	Heat sink sub	212000066000	2
△	19 960 0036 307	Power trans	820057001004	1
△	19 960 0036 501	Power trans	Asia model Europe and U.K. model	1
21	960 0084 304	Select knob	508702006102	1
22	960 0084 207	Power button	508702004102	1
23	960 0079 209	DENON Badge	563000042801	1
24	960 0014 701	Cassette mechanism	815021640001	1
25	960 0084 508	Loader panel	431702045101	1
26	960 0014 604	Cassette mecha loader	803000009001	1
27	960 0006 308	Top cover	300002009601	1
28	960 0014 002	4P Pin jack	JACK001	1
29	960 0004 407	Mini jack φ3.5	JACK101, 102	2
35	960 0037 403	Voltage selector	Asia model only	1
51	960 9000 156	Screw 3x17 Btipe ZNY/BH	B020030171B1	3
52	473 7508 033	Screw 3x14 CBTS(P)-B		4
53	960 9000 114	Screw 3x8 Btipe ZNY/BH	B020030081B1	10
54	960 9000 130	Screw 3x8 Btipe BK/FH	B020030083F1	2
55	960 9000 266	Tapping screw 3x6 ZNY/PH	B010530061P1	4
56	960 9000 208	Screw 3x8 Btipe BK/BH	B020030083B1	24
56	960 9000 208	Screw 3x8 Btipe BK/BH	Asia model only Europe and U.K. model	22
57	960 9000 237	Screw 4x8 Ctipe ZNY/BH	B020940081B1	4



NOTE FOR PARTS LIST

- Part indicated with the mark "◎" are not always in stock and possibly to take a long period of time for supplying. In some case supplying of part may be refused.
 - When ordering of part, clearly indicate "1" and "1" (i) to avoid mis-supplying.
 - Ordering part without stating its part number can not be supplied.
 - Part indicated with the mark "★" is not illustrated in the exploded view.
 - Not including Carbon Film ±5%, 1/4W Type in the P.W.Board parts list. (Refer to the Schematic Diagram)
- WARNING:
- Parts marked with this symbol △ have critical characteristics.
Use ONLY replacement parts recommended by the manufacturer.

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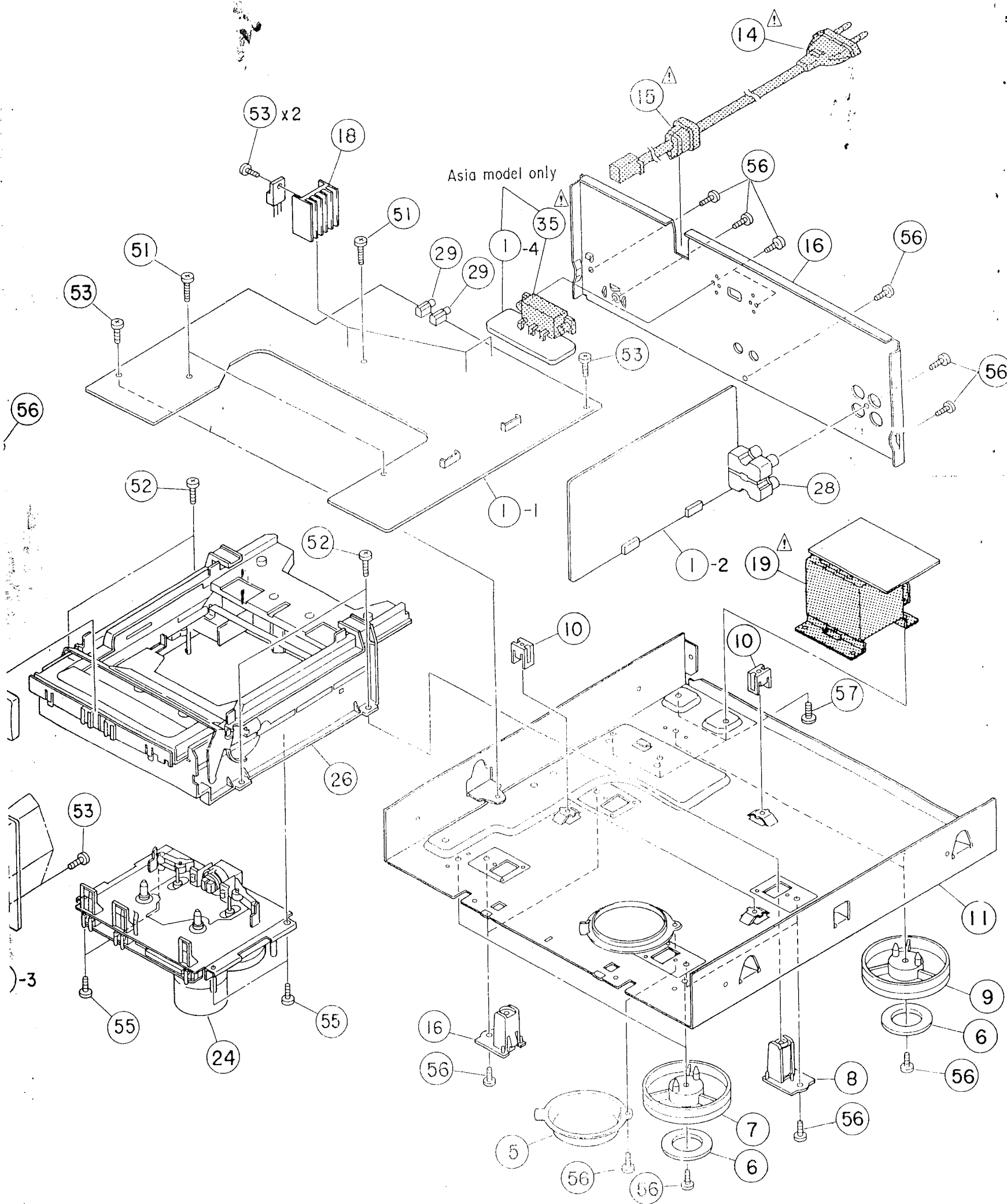
Remarks

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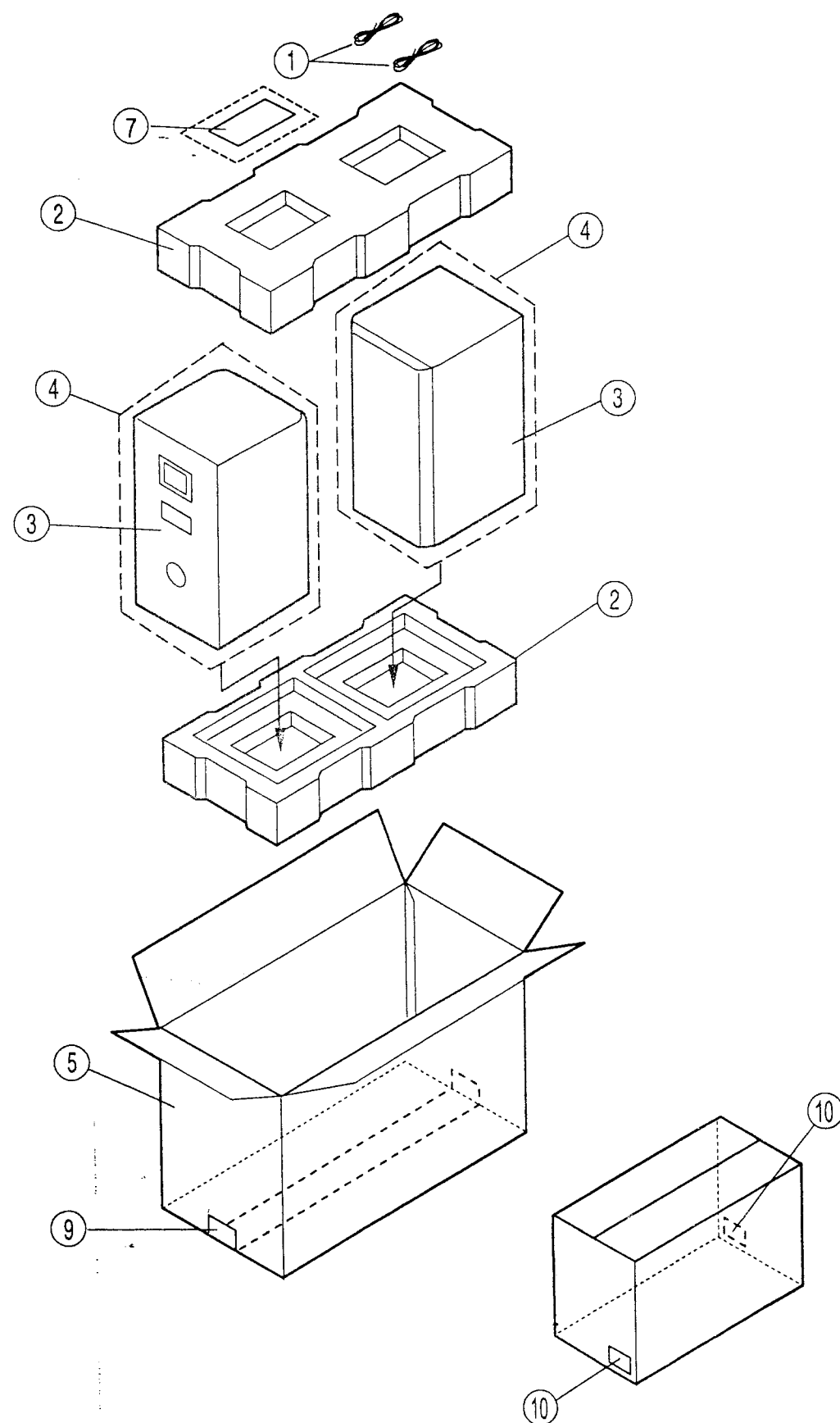
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PACKING VIEW

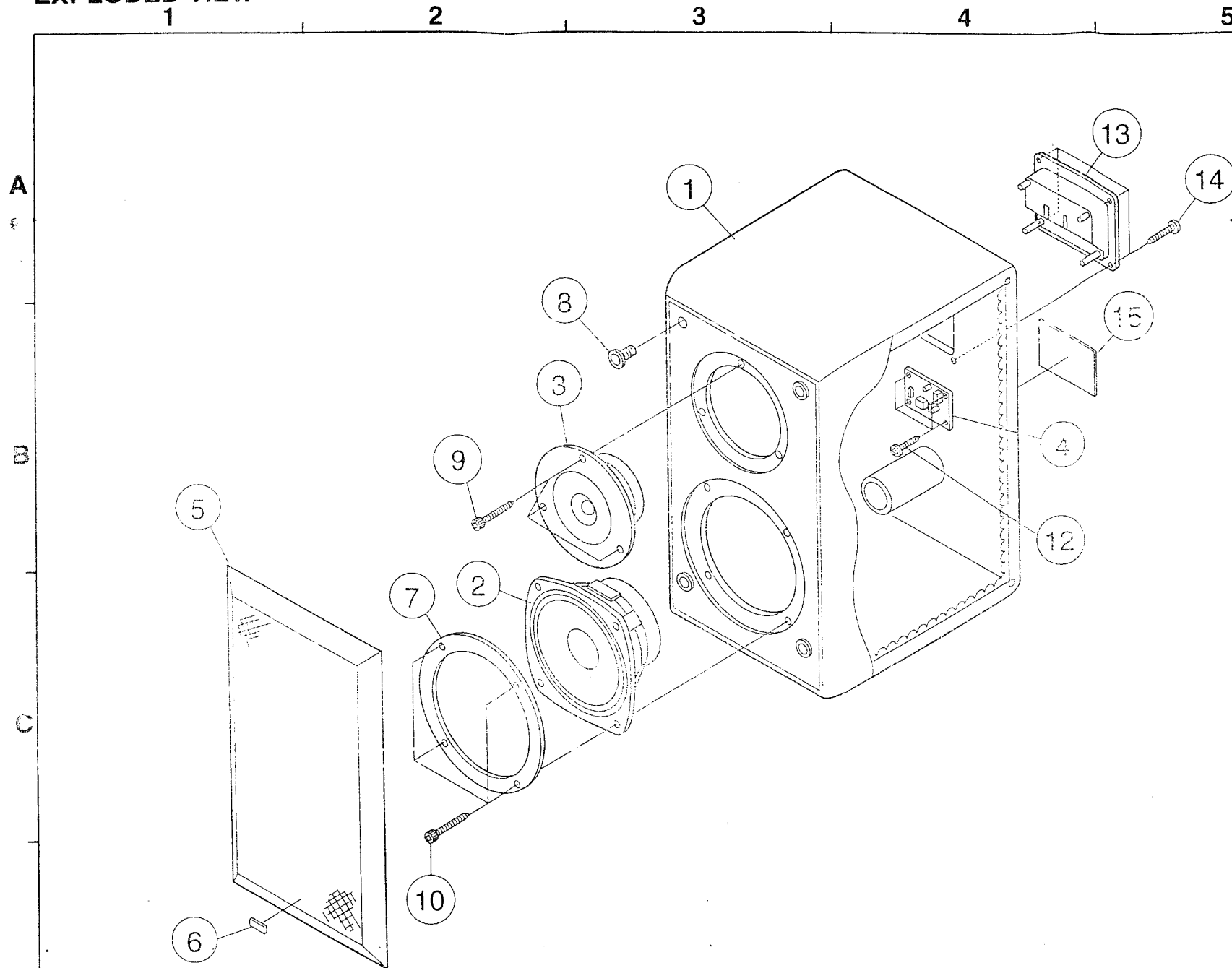


PARTS LIST OF PACKING & ACCESSORIES UNIT

Ref. No.	Part No.	Part Name	Remarks	Q'ty
1	960 0015 302	Speaker cable		2
2	960 0086 807	Cushion Ass'y		1
3	—	Speaker system unit (SC-F88)		1
4	960 0086 904	Poly bag	for set	2
5	960 0087 123	Carton case		1
7	960 0087 217	Operating instructions		1
9	—	OPP tape		1
10	—	Label control		2

SPEAKER SECTION

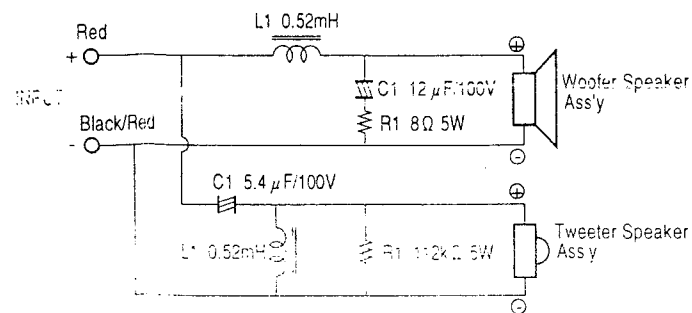
EXPLODED VIEW



PARTS LIST OF EXPLODED VIEW
SPEAKER SYSTEM SECTION(SC-F88)

Ref. No.	Part No.	Part Name	Remarks	Q'ty
1	960 0086 001	Cabinet ass'y	S1226111601	2
2	960 0086 108	Speaker (woofer)	W0226003101	2
3	960 0086 205	Speaker (tweeter)	W0203005401	2
4	960 0086 302	Network	W0306000801	2
5	960 0086 409	Grille board ass'y	W0804009704	2
6	960 0086 506	DENON Badge	W0801013101	2
7	960 0086 603	Decoration ring	W0703000517	2
8	960 0016 408	Holder	W0703001301	2
9	960 9002 400	Screw 3.5x20	W0503001701	6
10	960 0016 301	Screw 4x20	W050800307	8
11	—	Port	W0309022201	2
12	960 9002 413	Screw 3.5x18	W0503000501	2
13	960 0016 709	Terminal	W0710001301	2
14	960 0016 327	Screw 3x15	W0503000207	3
15	960 0086 713	Serial No.sheet	W1103017506	2

SCHEMATIC DIAGRAM



NOTE FOR PARTS LIST

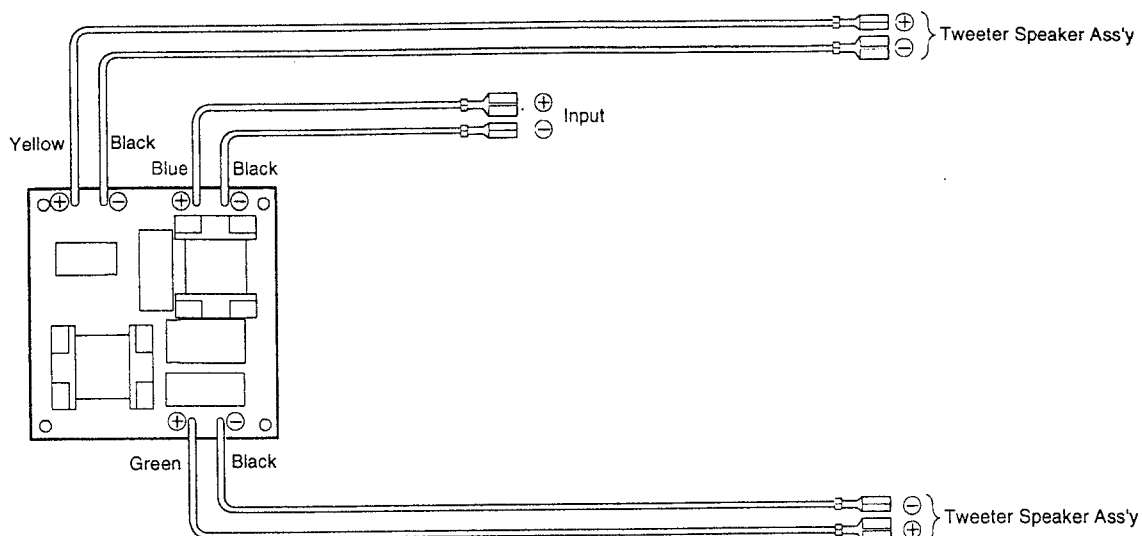
- Part indicated with the mark "O" are not always in stock and possibly to take a long period of time for supplying, or in some case supplying of part may be refused.
- When ordering of part, clearly indicate "1" and "1" (i) to avoid mis-supplying.
- Ordering part without stating its part number can not be supplied.
- Part indicated with the mark "*" is not illustrated in the exploded view.
- Not including Carbon Film $\pm 5\%$, 1/4W Type in the P.W.Board parts list. (Refer to the Schematic Diagram for those parts.)

WARNING:

Parts marked with this symbol  have critical characteristics.
Use ONLY replacement parts recommended by the manufacturer.

SPEAKER SECTION

NETWORK



PARTS LIST OF NETWORK ASS'Y

Ref. No.	Part No.	Part Name	Remarks	Q'ty
	—	P.W. Board		2
L1	—	Choke coil 0.52mF		2
L2	—	Choke coil 0.39mF		2
R1	—	Cement resistor 8Ω 5W		2
R2	—	Cement resistor 112kΩ 5W		2
C1	—	Electrolytic 12μF/100V		2
C2	—	Electrolytic 5.4μF/100V		2

WIRE FORMING

